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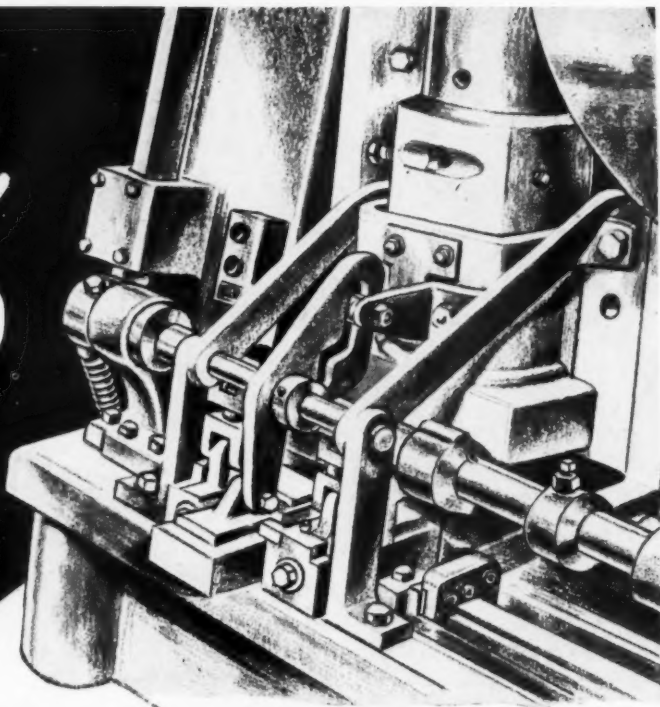


MARYLAND

"ALWAYS BEGIN WITH A GOOD FINISH"



*this was a*  
**GOOD  
IDEA**



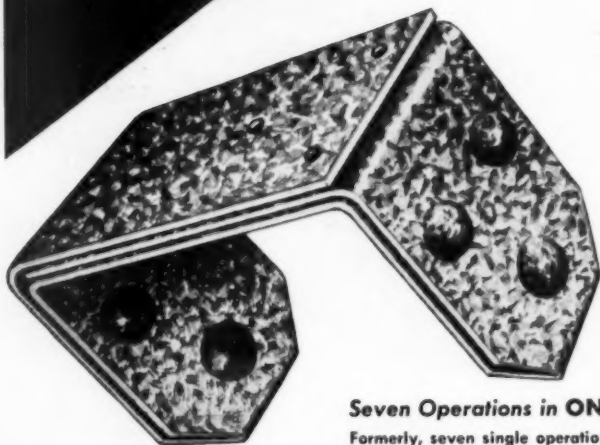
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**Our stamping and assembly services are now available  
if you have the dies and materials for the job.**



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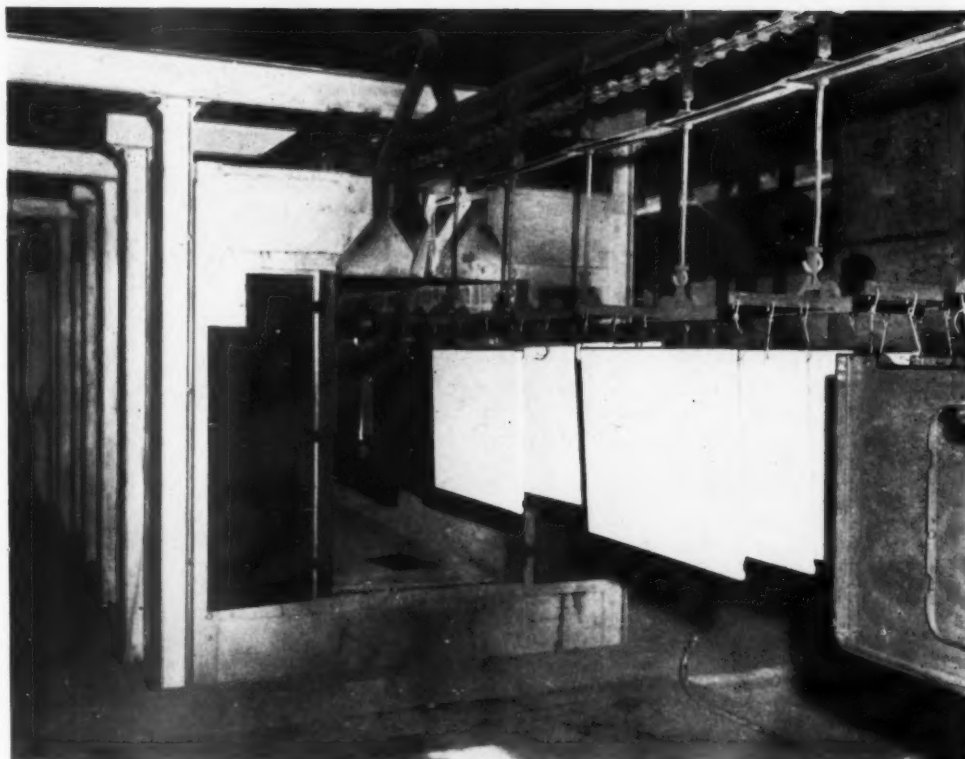
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carry the load in plant after plant



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Boland SINGLE FLOW furnaces provide unobstructed radiating surfaces on both sides of the ware, plus a pre-heat zone that raises the temperature gradually, thus fires the ware properly.

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No other furnace offers all of these important features. It will pay you to consult us for your furnace requirements.

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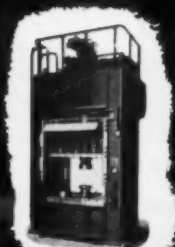
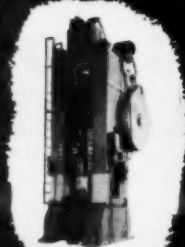
407 NORTH EIGHTH BUILDING • ST. LOUIS 1, MO.

Designers and Builders of Continuous and Box Type Enameling Furnaces  
finish OCTOBER • 1947

Here's  
how

# Verson MARK

This huge Verson automatic, transfer feed press performs 5 operations simultaneously on brake drum disks. Stock is fed into the right hand side of the press and formed brake drum disks discharged at the left.



# is pushing back the frontiers of metal forming

The origination by Dave and John Verson of the allsteel welded frame over 25 years ago marked the beginning of a new era in the press forming of metals. Using this revolutionary method of construction as the foundation, Verson has led the way in the development of more efficient machines to produce better products faster and at lower unit cost. Completely automatic operation has been combined with ingenious handling methods to permit manufacturing economies never before dreamed possible. We are

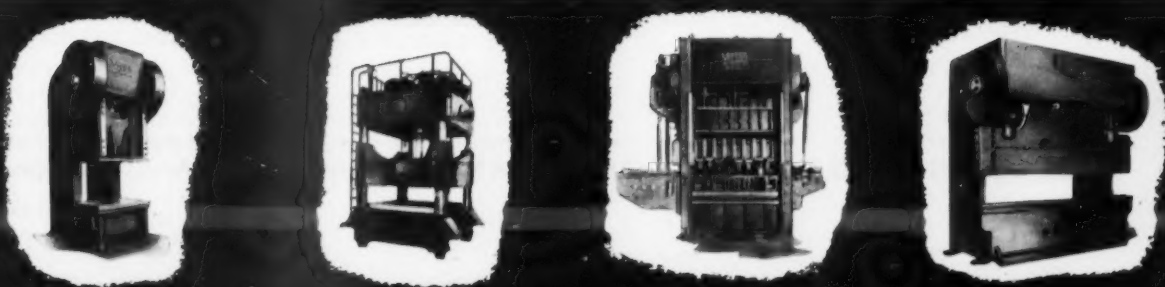
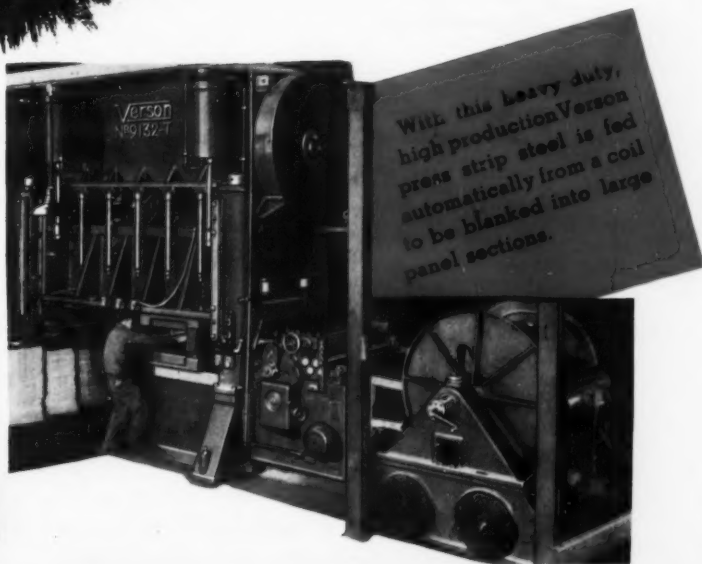
daily expanding the scope of applications for these modern production methods. Many products which must now be produced individually will soon be made on high production presses at almost unbelievable rates.

We would welcome the opportunity to discuss your stamping problems with you and show you how high speed methods can be adapted to the manufacture of your product.

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WITH VERSON EQUIPMENT.**

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# TITANIUM WHITE NO. 77

For years porcelain enameled have asked for a white cover coat enamel with high opacity, pleasing color, acid resistance and surface hardness, plus good workability in the enameling plant.

Century's new Titanium White No. 77 is as near an answer to this demand as any practical enameled could expect. While it is new, it is not too new, for it now has several months of successful operation behind it.

Stove parts, washing machine tubs, commercial refrigerators, reflectors, steel sanitary ware, signs and many other products have been successfully enameled during the past seven months with No. 77, with resulting advantages in product finish and salability.

For smooth plant operation and the production of the highest quality ware at lowest possible cost, we suggest Century time-proved ground coat and Century time-proved cover coat too.

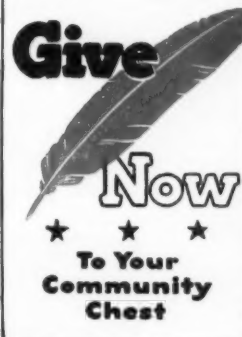
If you haven't tried the new titanium white, phone or write for a trial of No. 77 right now!



CENTURY VITREOUS ENAMEL COMPANY, 6641-61 S. Narragansett Ave., Chicago 38, Ill.



# THE Finish Line

**A MESSAGE FOR MANAGEMENT** — quoted from an address, "Importance of Selection of Proper Personnel," by Dr. Perry L. Rohrer, partner, Rohrer, Hibler & Replogle, before the Porcelain Enamel Institute Forum.

Dr. Rohrer pointed out that following phenomenal technological advances there has been an increased awareness of problems of improving plant layout, quality control, time study and increasing production facilities. In the midst of advancement in dealing with machines, processes and materials, there is an even greater need for progress in dealing with supervisors and key people in industry. Bursts of enthusiasm over foreman training, psychological tests, safety programs, etc., is not sufficient.

## A sound organizational philosophy

Says Dr. Rohrer, "This matter of top management's point of view on basic philosophy is central and fundamental to the whole of what can be hoped to be accomplished in the area of human relations in industry. It is rather futile to attempt a sound program of human relations in a company where the president and top management are so far removed in this manner of approaching fundamental issues that, practically speaking, it is quite obvious that they neither understand nor genuinely desire such concepts to be set in action. . ."

Three categories are set forth for convenience in clarifying management philosophies — Class C, the lower end of the scale; Class A, the upper; with Class B the middle. Only two will be covered on this page due to space limitation.

### Class C philosophy

"This organizational philosophy is typified by administrators who:

"1. Tend to be opportunistic in organizational matters. They make decisions on the spur of the moment without reference to decisions made previously or how they may conflict with decisions made by others.

"2. Give undue weight to tangential or detail matters and over-react to such items.

"3. Tend to be very dimly aware of people as such and equally insensitive to their reactions or the importance of such reactions to the organization.

"4. Tend to believe a raise in pay will cure any or all unhappiness their employees may have.

"5. Are always on the 'telling end' of the conversation and seldom in the 'listening' or 'inquiring' role.

"6. Tend to crave 'power over' rather than 'power with' people.

"7. Surround themselves with men who will agree with them or remain quiet and go along with all of their suggestions.

"8. Must have frequent verbal manifestations of praise from those who work for them.

"9. Compensate for undue harshness and outbursts of temper by becoming extremely kind and considerate at times."

### Class A philosophy

"This organizational philosophy is typified by administrators who:

"1. Tend to have jobs defined, policies formulated and to make decisions with dispatch. They weigh immediate issues in terms of the future and what will happen if a given course is taken. They think organizationally and delegate responsibility in well-defined manner.

"2. Are not unduly disturbed by minor incidents and hold steady while the major issues are being clarified.

"3. Are sensitive to the reactions of people and have a well-formulated policy of dealing with those who report to them.

"4. Are aware of the broad scope of basic factors which motivate people and give them a sense of security and motivation.

"5. Are skillful in cooperative thinking and discussion and are masters in the art of questioning. They have an adequate sense of timing in human relations; are stern when sternness is necessary; kind when kindness will be regarded correctly; direct when the situation calls for directness and are resourceful in other matters pertaining to human relations.

"6. Are skillful in developing team spirit. They motivate men to work as members of a team. Their leadership is spontaneously accepted. They identify with those who work for them but furnish leadership by adherence to a well-thought basic philosophy.

"7. Consistently surround themselves with strong people and seek to develop each to his maximal potential within the organizational pattern.

"8. Are skillful in gaining and holding the respect of those who work with them even in situations where the issues are not easily resolved.

"9. Serve as a balance wheel holding steady under pressure and maintain an objective point of view in the face of undue optimism or pessimism."

There is much more of importance in Dr. Rohrer's message. Would that we could all place ourselves in Class A.

*Dana Chase*

EDITOR AND PUBLISHER

# *The* DE VILBISS



A COMPLETE DEVILBISS LINE DESIGNED AND BUILT FOR PORCELAIN ENAMELING AND CERAMIC FINISHING

**HORIZONTAL  
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## **COATS FLAT SURFACES**

*automatically-faster and at lower cost!*

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Pre-determined adjustments regulate the spray pattern, over-lapping, length of travel and distance of the spray gun from the surface. The result is absolute uniformity and carefully controlled quality throughout the entire production run. The output of these machines in finishing wall tile, stove panels and similar products is astounding.

And these machines stand up in service without the necessity of frequent costly repairs. Vital parts of the automatic spray guns are constructed of materials which resist rust, corrosion and abrasive wear. Longer service, lower maintenance costs and fewer production shutdowns result.

Whether your product is tile, porcelain panels or other flatware it will pay you to investigate the advantages of DeVilbiss Automatic Spray Methods. Ask a DeVilbiss engineer to show you what they are doing for others and what they can do for you.

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EXHAUST SYSTEMS  
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● Two new Ing-Rich PORCELCLAYS—No. 55 for low set and No. 77 for high set. Blend the two . . . and you'll get your *exact* requirements for your particular problem. Not only laboratory-tested but also "plant-tested" in the field and in our own job enameling plant. They're *right*!

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OFFICES, LABORATORY AND PLANT  
FRANKFORT, INDIANA





# Economics and maintenance of industrial lighting systems

*By Walter Sturrock and J. C. Forbes* • ENGINEER SPECIALISTS,

LAMP DEPARTMENT, GENERAL ELECTRIC COMPANY, NELA PARK, CLEVELAND, OHIO

THE American Recommended Practice of Industrial Lighting, as approved by the American Standards Association in 1942, is the general over-all guide for current industrial lighting practices. This article discusses the advantages of good lighting both from an employer and an employee point of view. It also discusses the fundamental requirements of good lighting and the pre-war methods and equipments necessary to meet these requirements.

The ASA recommended practice bulletin was exceptionally timely in being published during the early months of the war when production facilities were being rapidly expanded. In particular, the minimum footcandle recommendations for various production processes became a wartime guide when the use of copper, steel and other scarce materials demanded ultra-conservation in their use. Many examples of well lighted plant experiences during the war could be sighted and the economics of the lighting system discussed. But we are now more interested in peacetime practices. Suffice to say that the conservative wartime levels were justifiable minimums and that the recognized benefits have given both management and employees a better understanding of just what constitutes good lighting. As a result, we now find an increasing demand for illumination levels which are at least as high as the wartime ASA approved American Recommended Practice of Industrial Lighting.

When consideration is given to the lighting systems for a new plant or to replacing obsolete systems, one of the most pertinent questions asked is, "How much do they cost?" This is a timely question because there is quite a spread between the compar-

atively low cost of filament luminaires and the higher cost of mercury and fluorescent luminaires, all of which are suitable under some conditions for industrial operations. Moreover, the answer to the question is too often given in terms of the labor and materials necessary to make the initial installations with little or no concern about the economics of amortization of capital investment or to operating and maintenance costs. Amortization and operating costs should, of course, be considered in computing the "over-all cost" of a system and, in order to show how these items affect the economics of lighting, a detail cost analysis is given in Table I for 8 different designs of industrial lighting systems. From this analysis it will later be seen that from an "over-all cost" point of view the most economical system for a given footcandle level of illumination does not necessarily have the lowest initial installation cost. It should, of course, be understood that all systems being compared must be capable of providing an acceptable *quality* of lighting which is a fundamental criterion for all good lighting systems regardless of how many footcandles are available. In other words, the selection of a satisfactory lighting system must include consideration of direct and reflected glare, elimination of harsh shadows, holding contrast within comfortable limits and in some cases the use of a particular color quality which, for example, may be required for the proper inspection of certain products. Assuming that all these important quality considerations have been properly handled by the plant owner or a competent illuminating engineer, with specifications as to the lighting equip-

ment and method of installation, it then becomes possible to compute, analyze and summarize "over-all costs." In order to simplify the analysis as much as possible it is assumed in this particular presentation that the lighting systems can all readily be connected to existing wiring systems for which cost estimates are not included.

## Cost analysis

To explain the items in the development of Table I, a short step-by-step analysis will be given for a typical 40-watt fluorescent system. The luminaire under consideration consists of a channel eight feet long which houses the ballasts and wires and supports the sockets and reflectors for the four 40-watt fluorescent lamps; two individual open-end industrial type reflectors being used with two lamps in each. An estimated purchaser's net price (less lamps) for this 2-reflector 8-foot unit is \$30.00 and it is further estimated that it will cost \$12.50 to have it unpacked, installed in the room, and wired to an existing distribution system. The four 40-watt lamps at a 30 per cent discount cost \$2.80. The sum of these three items gives an initial cost per luminaire and its installation of \$45.30. This is shown in the first column, item No. 6, of the table.

If this 191-watt unit is used in a plant working on a one-shift, 8-hour basis, it is estimated that it would be turned on for about 2500 hours in a year's time so that the annual energy cost, assuming a one-cent rate, would be \$4.80; a two-shift basis requires about 4000 hours burning per year, for which the energy cost would be \$7.60. This is the first item in the development

TABLE I		FLUORESCENT					
COST ANALYSIS OF 8 INDUSTRIAL LIGHTING SYSTEMS		PREHEAT-START 40-WATT 8-ft. section, open-end industrial-type unit four 40-watt lamps, 118 volts 60 cycle		INSTANT START 40-WATT 8-ft. section, open-end industrial-type unit four 40-watt lamps, 118 volts 60 cycle		PREHEAT-START 100-WATT 10-ft. section, open-end industrial-type unit four 100-watt lamps, 118 volts 60 cycle	
1. 2.	Rated lamp lumens per luminaire Watts per luminaire	9200 (8400) (d) 191		9200 (8400) (d) 216		16,800 (16,000) (d) 464	
3. 4. 5. 6.	INITIAL COST PER LUMINAIRE INSTALLED (not including wiring system) Purchaser's net price (less lamps) (a) Installation cost (a)(b) Lamps--net (30% discount) Total	\$30.00 12.50 <u>2.80</u> \$45.30		\$35.00 12.50 <u>3.40</u> \$50.90		\$55.00 14.00 <u>6.45</u> \$75.45	
7. 8. 9. 10. 11. 12. 13. 14. 15.	ANNUAL OPERATING COST PER LUMINAIRE Energy at 1¢ per kWh: 1-shift 2500 hrs. per year 2-shift 4000 hrs. per year Lamps: Hours life Number of lamps replaced per year Annual cost of lamps Labor for replacing lamps Total lamp cost Cleaning: Cleaning luminaire--twice a year Total operating cost (Energy plus Lamps plus Cleaning)	1-shift \$4.80   2500 4 \$2.80 <u>.80(c)</u> \$3.60 <u>\$1.20</u> \$9.60	2-shift \$7.60   4000 4 \$2.80 <u>.80(c)</u> \$3.60 <u>\$1.20</u> \$12.40	1-shift \$5.40   2500 4 \$3.40 <u>.40</u> \$3.80 <u>\$1.20</u> \$10.40	2-shift \$8.60   4000 4 \$3.40 <u>.40</u> \$3.80 <u>\$1.20</u> \$13.60	1-shift \$11.60   3000 3 \$5.30 <u>.60(c)</u> \$5.90 <u>\$1.50</u> \$19.00	2-shift \$18.60   4500 3 \$5.80 <u>.70</u> \$6.50 <u>\$1.50</u> \$26.60
16.	Annual owning cost per luminaire (16-2/3 per cent of items 3 & 4)	\$7.10	\$7.10	\$7.90	\$7.90	\$11.50	\$11.50
17.	TOTAL ANNUAL COST PER LUMINAIRE (item 15 plus 16)	\$16.70	\$19.50	\$18.30	\$21.50	\$30.50	\$38.10
18. 19. 20. 21.	ANNUAL ILLUMINATION COST--assuming typical large area of which 8000 sq.-ft. is provided with 50 foot- candles maintained in service. Coefficient of Utilization (A--50%-30%) Maintenance factor (f) Number of luminaires (g) TOTAL COST FOR ASSUMED AREA	.69 .65 100 \$ 1670 100%	.69 .60 108 \$2110 100%	.69 .65 100 \$1830 110%	.69 .60 108 \$2320 110%	.65 .65 58 \$1770 106%	.65 .60 63 \$2400 114%

of the operating cost of which other items are lamps and cost of cleaning.

Operating experiences and tests show that the life of fluorescent lamps depends to a considerable extent upon the number of burning hours per start. The longer the lamps are burned for each time they are turned on, the longer the over-all life will be and, therefore, industrial plants having a two-shift work schedule (8 hours per shift) will get a longer over-all average lamp life than will plants having only a one-shift schedule. In fact, one frequently finds that fluorescent lamps in industrial plants will have a service life of about a year, regardless of whether the plant has a one- or two-shift work schedule. Items 8 and 9 in the table therefore indicate that

the lamps will have to be replaced once a year for both of the assumed conditions of operation. The cost of the four lamps is \$2.80 to which is added \$0.20 per lamp for replacement labor, making an annual lamp cost per luminaire of \$3.60. If it costs \$0.60 to clean the two-reflector unit, it will cost \$1.20 to clean it twice a year.

Item 15 in the table shows that the total annual cost of operating this particular luminaire is the sum of the costs for electrical energy, lamp replacements and cleaning which amounts to \$9.60 under one-shift operation and \$12.40 under two-shift operation.

It should now be emphasized that this total annual operating cost does not include any amortization charges for the investment required in pur-

#### Footnotes:

(a) Estimated.

(b) Includes cost of installing and wiring to branch circuit.

(c) Replacement cost per lamp for fluorescent conventional-start is estimated to be double that for instant-start, to include added expense of service of starters which are a part of the conventional-start system only. With instant-start and the smaller diameter lamps, no starters are involved.

(d) Lumen values for all fluorescent systems based on white lamps (3500°K). For 4500° white, lumen output is 5-10 per cent lower.

chasing and installing the equipment. A reasonable per cent of this investment, which in this case amounts to \$32.50, should be charged off each year in order to get a true estimate

		MERCURY		COMBINED MERCURY AND INCANDESCENT		INCANDESCENT	
100-WATT open- unit 118 volt	SMALLER DIAMETER industrial-type unit, 96-in. 51-watt lamps, ma., 118 volts 60 cycle	Two 400-watt mercury lamps two-lamp ballast, 230 volts, 60 cycle, twin porcelain enamel wide distribution reflectors		One 3000-watt mercury lamp, 460-volt, 60 cycle ballast, porcelain enam- eled reflector		Two 400-watt mercury lamps one 1000-watt incandescent lamp, porcelain enameled reflectors, 120 volts, 60 cycle	
100 (d)	12,800 (12,200) (d) 260	32,000 870		120,000 3190		26,750(*) 940	
	\$44.00 12.50 <u>7.60</u> \$64.10	\$36.00 20.00 <u>14.70</u> \$70.70		\$120.00 30.00 <u>30.80</u> \$180.80		\$21.00 15.00 <u>8.60</u> \$44.60	
2-shift	1-shift 2-shift	1-shift 2-shift	1-shift 2-shift	1-shift 2-shift	1-shift 2-shift	1-shift 2-shift	1-shift 2-shift
\$18.6	\$6.50 \$10.40	\$21.70 \$34.80	\$79.70 \$127.60	\$23.50 \$37.60	\$25.00 \$40.00	\$25.00 \$40.00	\$25.00 \$40.00
4500 3.6 \$5.80 7.20 \$6.50	2500 4 \$7.60 40 \$8.00	4000 4 \$7.60 40 \$8.00	4000 1.25 \$9.20 30 \$9.50	6000 1.25 \$9.20 30 \$9.50	3000 1.33 \$25.60 80 \$26.40	4000/1000 .63/1.25 \$7.70 40 \$8.10	6000/1000 .63/2.0 \$9.50 60 \$10.10
\$1.50	\$1.20 \$1.20	\$0.80 \$0.80	\$2.00 \$2.00	\$0.55 \$0.55	\$0.30 \$0.30	\$0.30 \$0.30	\$0.30 \$0.30
\$26.60	\$15.70 \$19.60	\$32.00 \$45.10	\$108.10 \$171.90	\$32.15 \$48.25	\$32.05 \$51.10	\$32.05 \$51.10	\$32.05 \$51.10
\$11.50	\$9.40 \$9.40	\$9.30 \$9.30	\$25.00 \$25.00	\$6.00 \$6.00	\$2.80 \$2.80	\$2.80 \$2.80	\$2.80 \$2.80
\$38.10	\$25.10 \$29.00	\$41.30 \$54.40	\$133.10 \$196.90	\$38.15 \$54.25	\$34.85 \$53.90	\$34.85 \$53.90	\$34.85 \$53.90
.65 .60 65	.65 .60 77	.65 .60 83	.65 .70 28	.65 .65 31	.69 .70 7	.69 .70 7	.65 .65 37
\$2400 114%	\$1930 115%	\$2410 114%	\$1160 69%	\$1670 79%	\$930 57%	\$1380 65%	\$1300 78%

(e) Lumens per luminaire in this case represent one-half of total lumen output of two outlets, one 1000-watt incandescent lamp on one and two 400-watt mercury lamps on the other: 21,500 (1000-watt incandescent) + 32,000 (two 400-watt mercury) = 53,500.  $53,500 \div 2 = 26,750$  lumens per outlet. Costs, number of lamp replacements, and wattage are computed on this same basis.

(f) Maintenance factor includes loss of light to 70 per cent rated lamp life, reduced by a further 20 per cent for dirt collection.

(g) For other room conditions, number of luminaires is inversely proportional to coefficient of utilization.

of the annual owning and operating cost. It is, of course, realized that accounting procedures will vary with individual companies and therefore it is very difficult to pick a particu-

lar percentage which is at all representative. Some procedures have charged off 100 per cent the first year with nothing the following years, and others have charged off percentages ranging all the way down to and including five per cent for each year. A figure of 16-2/3 per cent of the purchaser's net price for the fixture plus the installation cost is believed by the authors to be a fair charge-off and therefore has been used in this analysis. It amounts to \$7.10. When this is added to the cost of operation it gives a total annual cost per luminaire of \$16.70 for one-shift operation or \$19.50 under two-shift operation.

Continuing the analysis to develop the comparative annual owning and operating cost of several complete lighting systems, it is only necessary

to establish the relative number of luminaires to be used in each of them in order to produce equal footcandles. It is therefore assumed that each lighting system is installed in an 8000 sq. ft. section of a large industrial area, where the various types of equipment can be installed at the proper height to justify a Room Index of "A" and that the ceiling and walls have 50% and 30% reflection factors respectively. Under these conditions 100 of the 8-foot 40-watt units for one-shift operation will provide 50 footcandles in service and the estimated over-all annual cost is  $100 \times \$16.70$  or \$1670. For the two-shift operation 108 units are found to be necessary because the average lumen output of fluorescent lamps having a life of 4000 hours is less

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# Sixteenth annual PEI meeting

Porcelain Enamel Institute annual meeting and sales and management conference  
at Hotel Cleveland, Cleveland, Ohio, October 9 and 10

THE Porcelain Enamel Institute annual meeting and sales and management conference will be held in Cleveland, Ohio, at Hotel Cleveland, October 9 and 10.

Regular business and administra-



"Red" Motley

tion functions of the Institute are scheduled for the first day of the session, with a potent sales and management conference on the agenda for the second day.

## Sweeney is keynote speaker

An address on the need for more intensive selling methods, by A. M. Sweeney, manager of sales, major appliances, General Electric Company, will keynote the conference.

Following the opening speech, prominent men in the fields of selling and advertising related to the porcelain enameling industry will discuss what manufacturers of porcelain enamel products must do to strengthen their market position in the immediate future against competitive materials.

Red (Arthur Harrison) Motley, president of Parade Publications, recognized by many persons as having a keen insight into current business trends as well as a broad knowledge of economic factors in America, will deliver the luncheon address, October 10.

A visual demonstration of the qualities and versatility of porcelain enamel, in the form of a new full color slide film, will be exhibited as part of a demonstration display clinic at the conference.

The complete list of events is outlined in the program printed on this page.

The Institute invites top management and sales managers of all companies interested in porcelain enamel or its use to attend the sales and management conference on October 10. Appliance and finished product ex-

ecutives are promised information of importance to the sale of their porcelain enameled products.

A special invitation is extended to American Gas Association members attending their Cleveland meeting, which lasts through to October 8, to attend the sales and management conference.

Those planning to attend the conference should write or wire the Hotel Cleveland immediately for reservations, stating that they are wanted in connection with the P.E.I. annual meeting.

## Program

### Annual Meeting

Thursday, October 9

- 10:00 a.m. Registration
- 10:15 a.m. Meeting of Porcelain Enamel Institute Executive Committee
- 11:00 a.m. Divisional Meetings
- 12:00 a.m. Luncheon
- 2:00 p.m. 16th Annual Meeting of Porcelain Enamel Institute (Election of Trustees)
- 4:15 p.m. Board of Trustees Organization Meeting
- 7:00 p.m. Annual Banquet and Introduction of Officers

### Sales and Management Conference

Friday, October 10

- 9:00 a.m. Registration
- 9:30 a.m. Sales Begin with Finish.....A. M. Sweeney,  
General Electric Company
- 10:15 a.m. Dramatizing Porcelain Enamel  
through Demonstrations.....Dana Chase,  
Dana Chase Publications
- 11:15 a.m. Selling Architectural Porcelain Enamel.....Roger Allen,  
American Institute of Architects
- Selling Porcelain Enamel Signs.....Paul R. Fritsch,  
Goodyear Tire & Rubber Company
- 12:30 p.m. Luncheon  
Address.....Arthur H. Motley,  
President, Parade Publications
- 2:15 p.m. How to Sell Porcelain Enamel to Women.....Edith Ramsey,  
American Home Magazine
- How the Porcelain Enameled Kitchen Utensil Manufacturers  
Met a Competitive Market.....D. C. Hunter,  
Enameled Utensil Mfgs. Council
- 3:45 p.m. Market Research Points the Way.....Floyd Woelslagle,  
Carnegie-Illinois Steel Corporation,  
Chairman, P.E.I. Market Research Committee
- Porcelain Enamel Institute Sales Aids and  
How to Use Them.....R. A. Dadisman,  
American Rolling Mill Company,  
Chairman, P.E.I. Market Development Committee



# A typical jobbing plant

## for cast iron and sheet metal enameling

photo story and description of a plant which enamels everything from die casters' bowls to store fronts

Illustrated with finishfotos exclusively

By Dana Chase

**finish**

A short motor trip through the Pennsylvania Hills from Philadelphia will bring you to Reading, home of J. M. Seasholtz

& Sons, Inc., which can readily be classed as one of the "early" porcelain enamel jobbing shops.

It is a typical jobbing plant in that it is equipped for running all types of porcelain enameled ware, both cast iron and steel, instead of for straight-line production as in the case of many of the appliance or "captive" plants.

Total manufacturing space is about 15,000 sq. ft., with storage space of 5,000 sq. ft. A sheet metal fabricating shop of 4,500 sq. ft. is located in a separate building adjoining the enameling plant. All materials can be delivered on two separate railroad sidings, representing two different railroads. The majority of outgoing shipments are by motor trucks.

### Over thirty years

#### of porcelain enameling service

In 1916 the late John M. Seasholtz established the plant for the application of porcelain enamel to stove castings. The purpose then was more for protection against corrosive cooking vapors and the natural deterioration of cast iron on kitchen stoves than for use as a style or beauty aid.

Principals in the company now include Ralph E. Seasholtz, president; Edward L. Seasholtz, secretary and treasurer, and Paul Seasholtz, vice president. Plant superintendent is Charles Rhine.

From the modest start as a cast iron enameling plant, it gradually grew to take in steel enameling and, as in the case of most present day jobbing plants, now offers both steel fabricating and enameling services.

### From die casters' bowls to porcelain enameled store fronts

Our industry must, in most cases, depend on plants such as this for the development of new markets, due to the ability of the jobbing shop to run many different types of parts simultaneously. The production of this plant includes exterior and interior facing panels and parts for refrigeration units; architectural panels for store fronts, gas station and industrial building; stove parts; signs of all descriptions and colors; railroad signal blades and markers,

and many other equally divergent products.

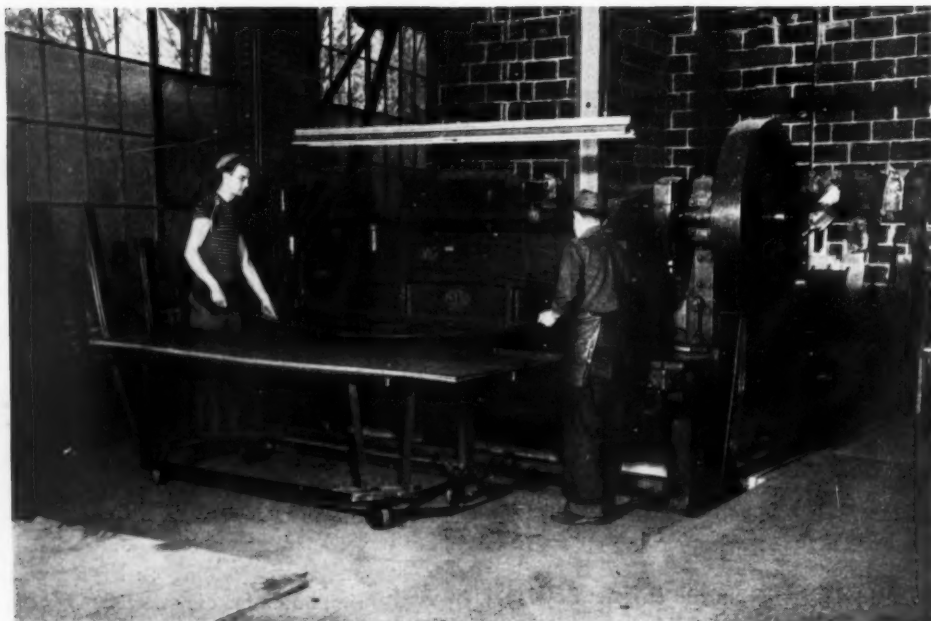
Some of the less common items now porcelain enameled include textile machinery castings, scale parts, restaurant table bases and pedestals, and special coating on large processing bowls for die casters.

During the war, items were designed and produced for the processing, storage and dispensing of foods and liquids for the Armed Forces; parts of sterilizers for the Medical Corps; and a number of combat items and special parts for industrial processing equipment.

The mill room is equipped with small mills to provide flexibility due to the many different types of enamel that must be applied. Enamels used are both acid resisting and non-A.R., but operating details of the mill

*Ed Seasholtz demonstrates the use of a special clip for the application of porcelain enameled architectural units.*





*Operating a shear in the corner of the fabricating department at J. M. Seasholtz & Sons, Inc.*

room are being planned so that practically all enamels for sheet steel and cast iron will be acid resisting.

The pickling room includes high capacity tanks to provide for commercial refrigerator parts, large signs, etc.

Equipment for firing the ware consists of two box-type furnaces. The electric furnace for firing sheet steel parts exclusively is 42" x 98". A variety of tools, including high-pin point bars, A-frames, etc., are avail-

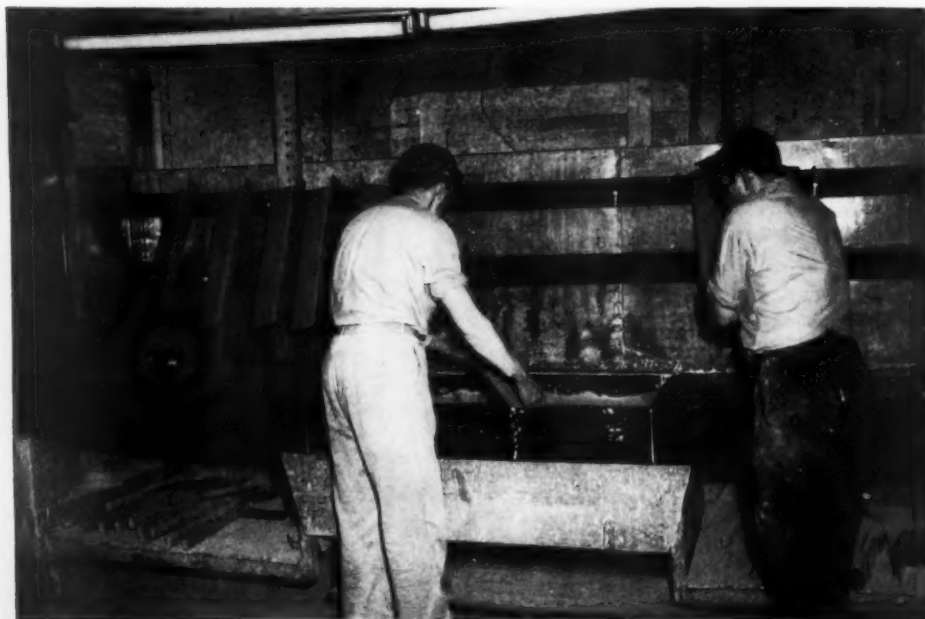
able for the many types of ware to be fired.

#### **Skid extensions for large pieces**

The other enameling furnace is 52" x 144", is oil-fired, and is used for both cast iron and sheet iron. For transporting 8' and 10' pieces, especially designed extensions to regular wooden skids have been added so that only one jack-lift is required to move a skid load of heavy long pieces.

Application of cast iron enamels is largely in one coat over cast iron ground coat, except for special parts requiring acid resisting finish.

In a section for ground coat application to steel, an excellent setup is provided for dipping small parts. The essential dip tank is located between two sloping drainboards and sufficient hanging space is provided for adequate draining. Two dippers can operate from a single tank with helpers unloading the drain rack.



*Photo shows the well-lighted ground coat dip tank setup for small parts. Tank and drainboards are porcelain enameled.*

*Box-type furnace for firing steel parts. Burning tools include long point pin bars and "A" frames.*



Ground coat is applied to all of the larger parts by spraying.

One of the cover coat spray booths is 12' long so that it can accommodate any part or sheet of practical size for enameling.

Screen process is used on both cast iron and sheet steel parts. Parts decorated by this method include scale castings, refrigerator panels or sills, etc.

As mentioned, the plant is equipped to do both fabricating and enameling

of steel parts. All castings for cast iron enameling are procured on the outside from local foundries or product manufacturers, and are sand-blasted and enameled at the Seasholtz plant.

#### **Large demand ahead**

The principals of this company have had an opportunity to observe the progress in the porcelain enameling industry and the expansion of the finish into many new fields.

They operate a plant without frills, but with what they consider the essential equipment and control to readily follow industry trends. It is their policy to cooperate with product producers who feel they may profitably use porcelain enamel, with a view to broadening the overall market. They expect to continue as a factor in the field of architectural porcelain enameling, and look for a great increase in this business when steel is more readily available.

*This large spray booth, 12 feet long, is used for the application of finish coat enamel on all parts of large dimension.*



# The development of modern covercoat enamels

a comparison of reflectance, amount of material used  
and cost for a twenty-five year period

By Dr. G. H. Spencer-Strong • VICE PRESIDENT, RESEARCH DIVISION, PEMCO CORPORATION, BALTIMORE, MARYLAND

**finish**

The history of the development of the wet-process covercoat porcelain enamels over the past 25 years has been marked by a continuous effort to increase quality and at the same time reduce cost. The development has been marked by continuously increased opacity and a similar continuous decrease in the application weight and has culminated in the development of a covercoat enamel having not only maximum opacity at minimum application but also high-quality acid-resistant characteristics as well. The development has been further marked by a continued decrease in the use of mill additions whereby the opacifier content has been reduced from approximately 8% in 1922 to from 0 to 1% in 1947.

At the same time enameling clays have been improved so that with the latest covercoat enamels the clay content is at least 50% less than the amounts previously required, with no sacrifice in the workability of the enamel. The industry has been well aware of the technical phases of these developments but the economic factors have not been nearly so thoroughly discussed.

## Application weight decreases with improved reflectance

The accompanying charts trace the enamel development both in regard to technical improvement and cost. The bottom chart shows the continuous improvement in reflectance characteristics at commercial application weights. In general the industry has taken advantage of each improvement

in reflectance by decreasing the application weight. As a result the average covering power or reflectance of porcelain enamels, as applied in the industry, does not reflect the actual improvements in covering power which enamel developments have made possible. In general, therefore, until the development of the titanium opacified enamels, the reflectance

### Editor's Note:

While *finish* is not interested in the sale of commercial products, we do feel, however, that there have been outstanding developments in porcelain enamel formulas and production techniques which should be outlined in the industry press. This brief article should give everyone associated with the industry a new realization of the rapid pace at which porcelain enamel finishes are advancing.

tance of the average commercial product at minimum application weight was in the range between 70 and 75%.

## Entirely new types of enamels developed

In general, each major break may be explained by the development of an entirely new type of enamel. Thus, for example, the 1920's saw the use of fluorine-opacified and low antimony-opacified enamels with their characteristic low reflectance and high application weights. The year 1930 saw the general introduction of moderate opacity antimony enamels. 1934 saw a further improvement of this type of material. In 1938 the super-opaque antimony-opacified enamels came into general use. Although the reflectance characteristics as shown at commercial application weights were only slightly better than

the enamels in use in 1934, actually, the application weight was reduced about 30% and the opacifier content cut in half.

The year 1942 saw the zirconium-opacified enamels well established and again, savings were made at the expense of application weight and opacifier content rather than in improvement in the reflectance of the finished product. The war's end saw an improved zirconium-opacified enamel. In most cases no change was made in the application weight and, therefore, an increased opacity was obtained.

## Titanium-opacified enamel introduced in 1946

The year 1946 saw the introduction of the titanium-opacified enamel, giving reflectances in the neighborhood of 80% with very low application weight. On the chart the dotted extension to the bars for 1946 and 1947 show the reflectance characteristics of this particular material. The reduction in application weight is clearly shown in the center table. The gradual increase in square footage coated by 100 pounds of milled frit at commercial application weight is shown. It will be noted that the covering power of commercial frit increased with each new development from approximately 280 square feet per 100 pounds of frit in 1922 to 540 square feet in 1942 and 1946. Again, the dotted line shows the increased covering power of the titanium-opacified enamels which, with their low application weight and high reflectance, make possible a further increase in the square footage covered by 100 pounds of frit to 1,040 square feet. In other words, the



modern enamel will cover approximately 3½ times as much area per unit weight as the frit in common use 25 years ago.

The uppermost chart is concerned with the economic factors induced by these developments. It shows the covercoat enamel cost per 100 square feet at commercial application weights. These costs include all the advantages of decreased opacifier content, etc. They do not, however, take into account the very marked savings made possible by the developments. Thus, for example, the moderately opaque antimony-opacified frit used in 1934 made possible a 50% decrease in enamel cost over 1922. Also, there was a hidden savings in that the 1934 enamel required only two operations whereas in many cases the 1922 enamel required three. Again, the actual enamel savings per square foot between 1934 and 1938 amounted to 45¢. Actually, the total savings were much greater due to the

fact that the super-opaque enamels, which began to find favor in 1938, required only a single operation.

The titanium-opacified enamels are again shown in 1946 and 1947 as the dotted bar, whereas the super-opaque zirconium enamels are shown as the solid bar. The greatly decreased application weights of these enamels made possible further marked decreases in the enamel cost per square foot. This decrease has actually been much greater than shown on the graph, since at the present time most operators are applying titanium enamel at a considerably lower application weight than the base weights used for these computations. Here, again, improved production efficiency and the elimination of separate acid-resistant coatings have made possible further decreased cost which cannot be shown in a chart of the type presented. It is interesting to note that the enameling cost per 100 square feet in 1946 using zirconium- or anti-

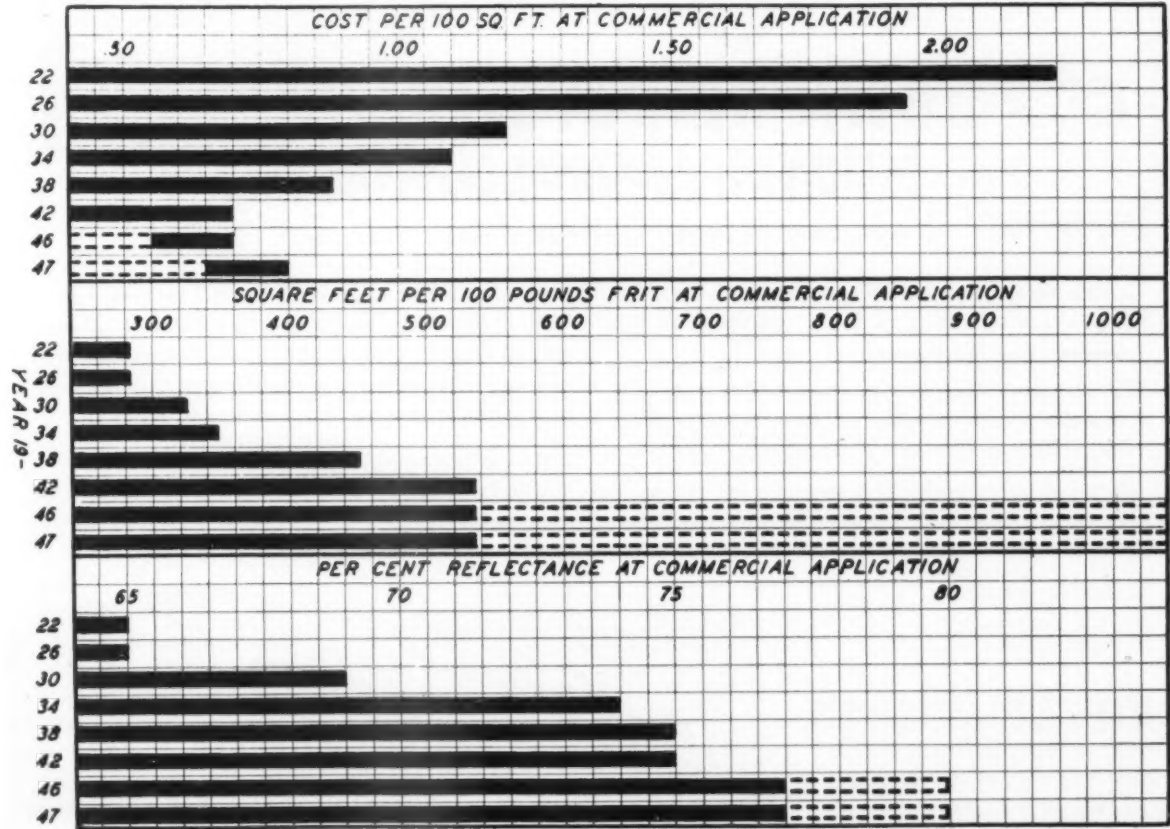
mony-opacified enamels was at the lowest point in the history of the industry and, even with the increased costs of 1947, is considerably lower than the 1938 cost.

Highest quality covercoat  
at lowest cost

In spite of the cost shown on the chart, the 1947 covercoat may be classed as the highest quality finish yet seen by the enamel industry, and at the lowest cost in the industry's history. This is due to the fact that application weights are still being gradually reduced so that at the present time the enameler actually uses less material than he did in 1946.

It will be seen, therefore, that the development record of the industry in covercoat enamels has been most creditable in that the quality of the product has been very markedly improved over the years while at the same time the cost of application has been markedly decreased.

The comparative cost of covercoat enamels made with typical frits from 1922 to 1947 is shown in the top table. The increase in covering power of commercial frits is illustrated in the center table. The bottom table shows the continuous improvement in reflectance at commercial application weights.





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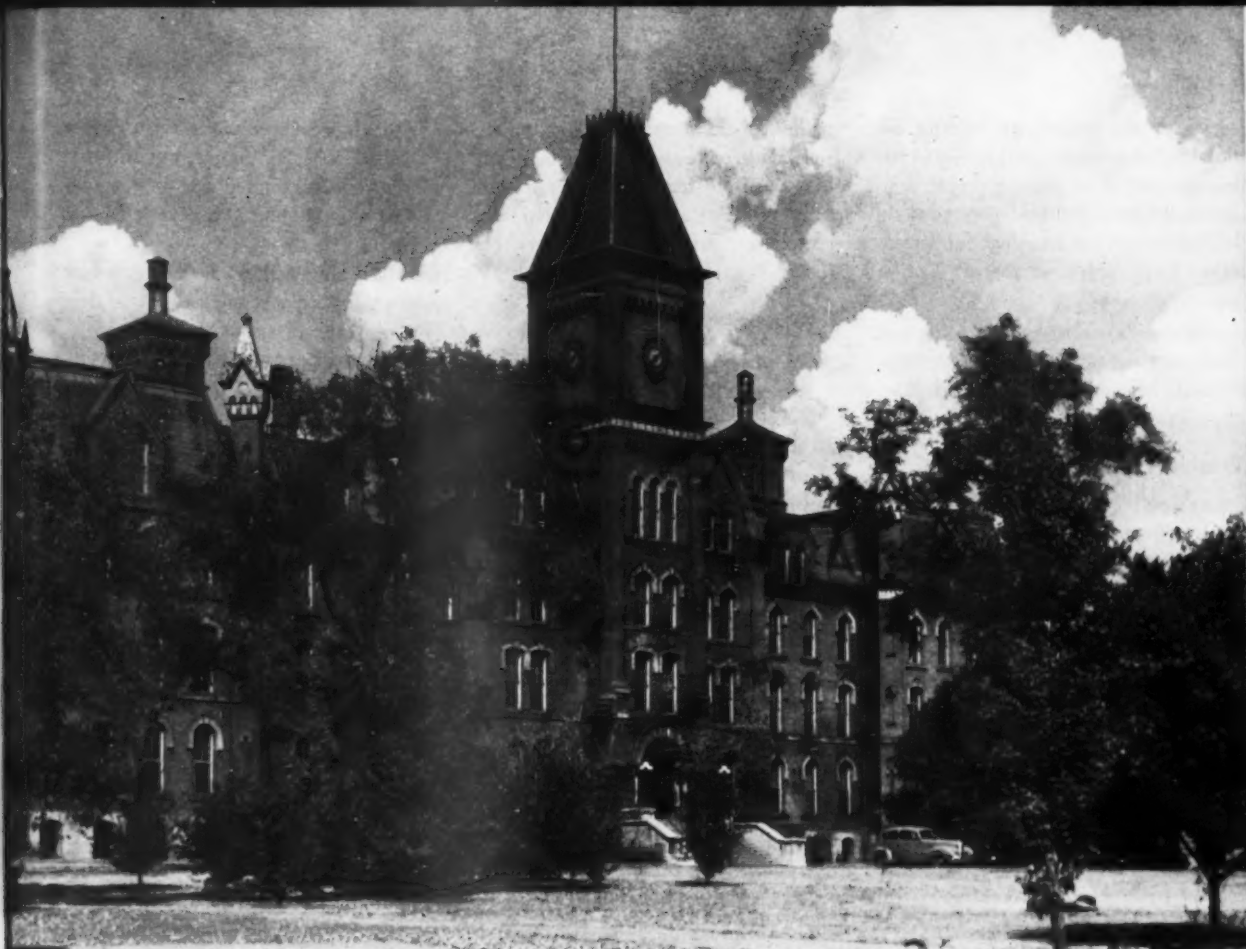
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SEVENTY-FIVE YEAR OLD UNIVERSITY HALL, OLDEST BUILDING ON OHIO STATE UNIVERSITY CAMPUS

## PORCELAIN ENAMEL INSTITUTE NINTH ANNUAL FORUM

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**P**RACTICAL enamellers from Massachusetts to Iowa and Ontario, Canada, to Texas met in Columbus, Ohio, September 10, 11 and 12 to join in the Porcelain Enamel

Institute Forum for plant men. In addition to Canadian representation, there was also a representative from both England and Scotland present for the meeting.

This year's program combined the usual wealth of papers on practical and technical subjects pertaining to the preparation of metal and the application of porcelain enamel with a



series of discussions by leading authorities on subjects pertaining to the human factor in plant management. These subjects included personnel selection, employee training, job evaluation, wage incentives and production planning.

All sessions were held in Campbell Hall, just across the street from traditional Mirror Lake in the heart of the Ohio State University campus.

#### **President stresses inter-industry competition**

In response to an address of welcome extended by Dean C. E. MacQuigg, of O.S.U., Richard Turk, PEI president, referred to the Forum Committee's policy for expanding the scope of the program: "The Forum this year has expanded its scope to consider certain management problems as they relate specifically to the Porcelain Enameling industry. It is no longer sufficient to know the technical aspects of enameling procedure to run a plant successfully. Costs are not alone determined by the technical ability of management today, but also by the skill with which we evaluate the human factors. These two combined are the measure of how well we are qualified for our job. It is the hope of the Forum Committee, in planning this year's program, that by bringing to you authoritative speakers we can fortify your present knowledge of human problems. We believe you will find this an interesting change that will make the Forum of increasing value to the industry."

President Turk then digressed from plant problems to say: "... it seems to me the Porcelain Enameling industry has yet to do its best selling job. Apparently we still seem to think that our only competition lies within our industry and when we go out to sell our product, we unwittingly do much damage to ourselves by placing too much stress upon the superiority of our enameled product over that of our enameling competitors, leading the prospective user to conclude that there are many possible weaknesses in the enameled finish and he had better leave it alone. . . . The smart competitor with another industry talks up his own particular product

without making unfavorable comparisons with competing products within his own industry. Some day we will fully realize that our competition is largely not within our industry but rather from other industries . . . "

#### **Choosing proper enamels and evaluating adherence**

R. M. King, Professor of Ceramic Engineering, Ohio State University, presided at Wednesday afternoon's session. Following the opening formalities, J. E. Hansen, Ferro Enamel Corporation, presented a paper "How to Choose the Correct Type of Porcelain Enamel for Specific Applications." As stated by the author, much of the material included in this paper was in the nature of review for experienced enamellers, but strong interest was evidenced by many present in requests for file copies of the paper to be used as a reference work.

A demonstration and discussion of a new type apparatus for evaluating adherence was presented by A. C. Francisco, P.E.I. Research Fellow, National Bureau of Standards. Equipment and suggested tests are tentative, but it was felt that decided progress has been made in arriving at a practical method of adherence evaluation.

#### **Metal surface preparation leads in interest**

Presiding at Thursday morning's session was F. A. Petersen, Special Research Associate, Professor of Ceramic Engineering, University of Illinois. The morning was devoted to a panel discussion — covering different systems of metal surface preparation. The panel included H. C. Ellinger, Philco Corporation — "Spray Pickling"; A. M. Langbein, American Stove Company — "Conventional Pickle Practice"; A. R. Mallonn, Republic Stamping & Enameling Company — "Bright Annealing"; and George Tuttle, Benjamin Electric Manufacturing Company — "Spray Cleaning and Pickling."

The interest in this problem could be readily measured by the fact that the meeting hall was well filled, and from all indications every one of the 215 plant men registered for the Forum were present for the discussion.

(Attendance at previous Forums has reached a higher figure, but the difference is accounted for in the absence of student registration this year.)

The Ellinger and Tuttle discussions were effective in contrasting two different types of spray pickling equipment; the Langbein discussion contained valuable cost data on conventional pickle practice; and the Mallonn paper described a method of cleaning that has attracted considerable attention, particularly in the holloware field.

#### **Fuels and their application**

Frank Hodek, Jr., General Porcelain Enameling & Mfg. Co., chairman of the Forum Committee, presided at the afternoon session on Thursday. Fuel oils were discussed in detail by William Jones, The North American Manufacturing Co., and the use of liquefied petroleum (LP-gas) and its logical applications were covered by E. A. Jamison, Phillips Petroleum Company. Immersion heating problems was the subject of S. E. Shepard, The North American Manufacturing Co. John Green, The Brown Instrument Co., presented a cleverly illustrated paper on "Pyrometry and Its Application in Porcelain Enameling Plants."

#### **Personnel problems and employee training**

J. B. Simons, Westinghouse Electric Corporation, presided at Friday morning's session.

Edward Arter, of Curtiss-Wright Corporation, presented an effective paper on "Employee Training," and illustrated it with demonstrations employing audience participation.

Second paper on the morning program was a most interesting discussion of "Importance of Selection of Proper Personnel," by Dr. Perry L. Rohrer, of Rohrer, Hibler & Replogle. It is this writer's impression that Dr. Rohrer's presentation would be a most valuable one for top management throughout the porcelain enameling industry, and it is urgently suggested that an attempt be made to schedule Dr. Rohrer for a future annual meet-

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# Ninth annual forum program report

with authors' resumés, editor's reports and excerpts from complete papers

THOSE responsible for the development of the program for the Ninth Annual Forum are entitled to a congratulatory note in connection with the presentation of one of the best balanced programs that has been offered at Porcelain Enamel Institute Forum meetings.

As has been the custom, *finish* is presenting comprehensive resumés of all papers made available by the authors. Due to the proximity of the Forum meeting to press date, it may not be possible to cover all papers in this issue. Resumés that were not received by press date, or for which

there is insufficient space in this issue, will be presented in the next issue.

Keyed letters following each title represent the following:

AR — Author's Resumé

ER — Editor's Report

EX — Excerpts from complete paper.

## How to choose the correct type of porcelain enamel for specific applications (AR)

By J. E. HANSEN

Since there are so many different porcelain enamel formulations used commercially, it is obvious that no one enamel can be ideally suited to all domestic or industrial purposes. Choice of the type of enamel for any item to be porcelain-finished should be governed by the service condition to be met.

Ground coats are selected upon a basis of having "workability" in the enamel shop, and providing freedom from defects in the finished ware. Blended ground coats, consisting of combinations of two or more frits, are usually advantageous in providing the workability needed in the shop and can be adjusted to provide some of the physical characteristics needed in the finished ware.

For resistance to thermal shock, a ground coat of high coefficient of expansion should be chosen; such a ground coat is also recommended to resist damage on small radii or on beads of kitchenware.

While hairline resistance is but slightly affected by enamel composition, it is greatly affected by such factors as design of the ware and firing practice.

Resistance to impact or adherence of the ground coat is usually a characteristic of the particular ground coat used, the steel base, the pickling treatment and the firing treatment. The blend of frits may usually be altered as required to compensate for major changes in steel or firing treat-

ment. Coefficient of expansion does not seem to affect adherence or impact resistance.

Ground coats which mature at a temperature of 1550° F. or lower (as compared to 1600° F. ground coats) usually result in less distortion of the ware during firing, and often permit the firing of ground coat and cover coat enamel together.

Finished ware may be called upon to resist the attack of acids, of alkalis, of general outdoor atmospheric conditions, of hot water, of repeated freezing action, of corrosion by soil conditions, or to be resistant to thermal shock, scratching and abrasion.

Cover coat enamels for kitchenware should have a low coefficient of expansion to produce good resistance to thermal shock; however, the beading enamel should have a high coefficient of expansion to resist failure on small radii or handles. A fair degree of acid resistance is required; solubility in boiling citric acid should comply with the E.U.M.C. recommendations and Commercial Standard CS 100-44 (Sept. 25, 1944) as approved by the U. S. National Bureau of Standards and a majority of the utensil manufacturers. Acid resisting antimony as well as antimony-free frits have been widely used; the titania-opacified frits have valuable properties and are also coming into extensive use.

Acid resisting enamel is recommended for at least the tops on gas

and electric ranges. The titania enamels present the possibility of economically finishing the whole stove in acid resisting enamel, but color matching is still not completely under control and limited availability of titanium oxide curtails the over all supply.

Acid resisting enamel is likewise recommended for use on refrigerator food compartment bottoms, hydrator pans, table tops and plumbing fixtures.

On table tops and plumbing fixtures the acid resistance should be not less than Class A, preferably Class AA. Resistance to scratching and abrasion is also important and enamels possessing a high bubble structure should be avoided. This includes avoiding gas opacifiers and clays containing large amounts of organic material. Transparent acid resisting overglazes may be used to cover non-acid resisting decorations on table tops.

Enamels of minimum bubble structure should be used on certain refrigeration units, where condensed moisture freezes on the surface and then is subjected to frequent repeated "defrosting" and freezing cycles.

On washing machine parts, where enameled surfaces are used in contact with corrosive hot alkaline laundry water, it is recommended that alkali-resistant enamels be used. This is particularly important on parts which are left as "ground coat finish," since most ground coats are not particularly resistant to alkalis; either an

alkali-resistant overspray should be used, or an alkali-resistant ground coat used.

Enamels particularly resistant to hot water under pressure should be

used for hot water storage tanks.

Enamels of at least weather-resisting and preferably acid-resisting properties are recommended for architectural panels.

In case of doubt as to what type of enamel to use for any purpose, advice can be requested from the P.E.I. or the technical departments of the various enamel frit manufacturers.

### Apparatus for evaluation of adherences (ER)

By A. C. FRANCISCO

Special equipment designed for testing the adherence of porcelain enamel to sheet metal was demonstrated and described together with tentative test methods. This represents one of the two principal projects now being worked on at the Bureau of Standards for the Porcelain Enamel Institute—the other being a review of existing surface abrasion tests. At present there is no standard test for adherence.

The test machine consists of a steel

stand supporting a head, movable on a rack and pinion. The plastic head contains 169 needles connected to a control box containing a power supply, rotary switch, and magnetic counter.

The basic principle of the machine is to lower the head containing the steel probes onto the steel surface which has been previously deformed so that the enamel spalls off. The well-known drop-ball test may be used for deforming the metal.

Each needle or probe represents a separate electric circuit connected to a rotary switch. A sweep-arm tests each support individually and records those circuits capable of conducting an electric current to a magnetic counter. The number of probes recorded for a series of tests are taken as proportional to the amount of bare metal exposed. This data can in turn be used to show comparative adherence.

### Continuous cleaning and pickling of parts for porcelain enamel with cable—type pressure spray machine (EX)

By GEORGE N. TUTTLE

Continuous cleaning and pickling machines of any type are highly specialized pieces of equipment designed to do a particular cleaning job after a thorough analysis of the product. This analysis should also include the mechanical operations preceding the enameling operations for best results. The cleaning, pickling, nickel flash, neutralizer and drying cycles must be accurately determined. Likewise, the size and shape of the ware must be considered before the machine can be properly designed. Once the machine is installed it is impossible to change the time cycle on any one tank or section without a proportional change on all others.

The conveyor passes through a series of tanks, placed end to end, which contain the solutions. Solutions are applied to the ware by means of high pressure sprays located above and below the conveyor. The body of the machine forms a tunnel-like enclosure through which this conveyor passes.

The installation has a conveyor width of 6'-0", operating at a speed of 4'-0" per minute. Overall height of tank is 5'-6", with an overall length of 95'-0". At 4'-0" per minute, about 24 minutes are required for the complete cycle. The length of time the ware is subjected to the solution sprays is controlled by adjustment

of the conveyor speed, and temperatures of all hot solutions are automatically controlled. The entire machine is built over a 4'-0" deep foundation pit, which provides return space for the endless cables and drainage for the entire system. A parallel section of the pit houses all pumps, motors and below-floor-level piping. Ready access to all mechanical equipment is provided by removable floor gratings. (For more complete description of this installation, see April, 1947, finish, page 19.)

#### Capacity

Capacity of the equipment varies with the design or shape of parts be-

J. M. Schappert



Ellinger, Mallonn, Langbein



Dr. Perry L. Rohrer



F. H. Guthrie



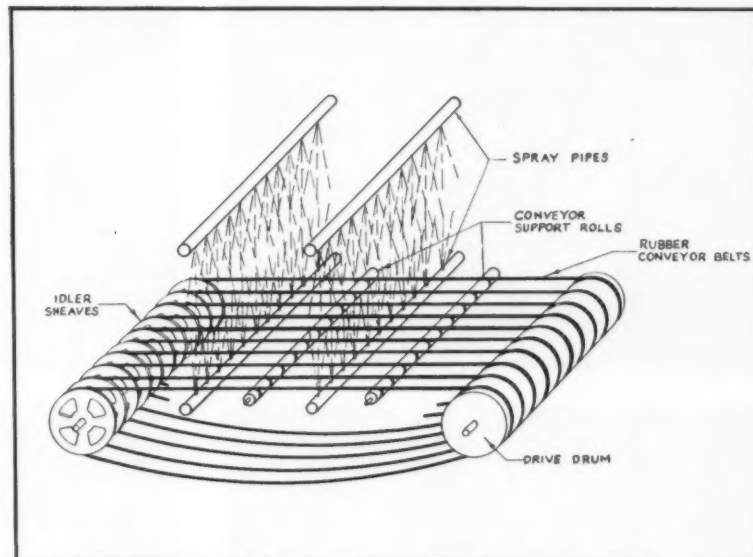
ing pickled which in turn affects the total pickling costs. In our installation, approximately 1450 sq. ft. of conveyor area enters the machine per hour. Capacity will be governed by the ratio of ware area to conveyor area required for that particular shape. For example, a washing machine tub with approximately 18 sq. ft. of area to be enameled requires 4 sq. ft. of conveyor area, or  $4\frac{1}{2}$  sq. ft. of tub area per square foot of conveyor area. Capacity of the machine for this item is  $4\frac{1}{2} \times 1450$  or 6525 sq. ft. per hour.

Some idea of our requirements for flexibility in a machine of this kind can be seen in the fact that our parts vary from small six inch diameter reflectors, through a complete line of several hundred different reflector shapes, to washing machine tubs as large as 25 inches square by 22 inches high.

#### Advantages and disadvantages

Laboratory and plant tests conducted during the six months operation of the machine show a ground coat bond and metal surface preparation which compares favorably with that obtained under the best conditions of immersion pickling, and this bond was more uniform from day to day. In general there was less etching of the metal surface in the continuous machine, particularly on cold rolled steels, but this did not appear to affect the ground coat bond.

Solutions applied by pressure sprays are accessible to all surfaces of the ware, since ware moving on the cables has no opportunity to become "masked" by other ware as is sometimes true when parts are nested in baskets. This means more uniformity



*Operating principle of the cable conveyor and the spray equipment.*

of treatment by all solutions and, consequently, uniform pickling of parts going into the enameling operation.

Automatic temperature controls of all hot solutions and absolute control of time in each operation, once the conveyor speed is adjusted, removes the factor of human error, and results in a considerable reduction of enameling defects traceable to improperly pickled ware.

Pressure spray cleaning and pickling equipment has limitations and certainly is not the answer to all of our cleaning problems. However, it has been our experience that when parts are not properly cleaned it can be traced to some poor practice preceding the cleaning operation, such as, to mention only a few, (1) storage of ware containing drawing compound for too long a time in high humidity and (2) fabricating parts from oiled stock without precleaning. In these cases the same troubles arise

except that here it is probably easier to make the required adjustments with the immersion tank cleaning method. Excluding such cases, the continuous pressure-spray pickling equipment has virtually eliminated repickling of parts in our plant.

As previously mentioned, one of the disadvantages of this type of equipment is the lack of flexibility in the process rather than in the type of production the equipment can handle. Once the parts are placed on the conveyor any waterbreaks or other evidence of poor cleaning cannot be detected until the ware has been completely processed. This factor may be relatively more important at the present time because of the immediate necessity of utilizing "off" grades of steel for enameling purposes.

Because of the greater carry-out of solutions from each tank, closer control is required with a continuous

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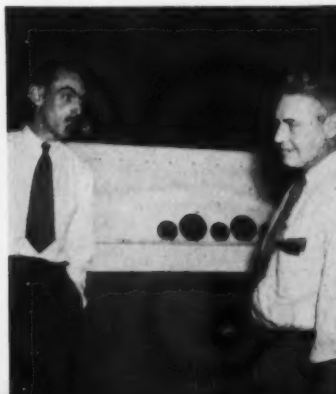
*E. H. Smedley*



*E. A. Jamison*



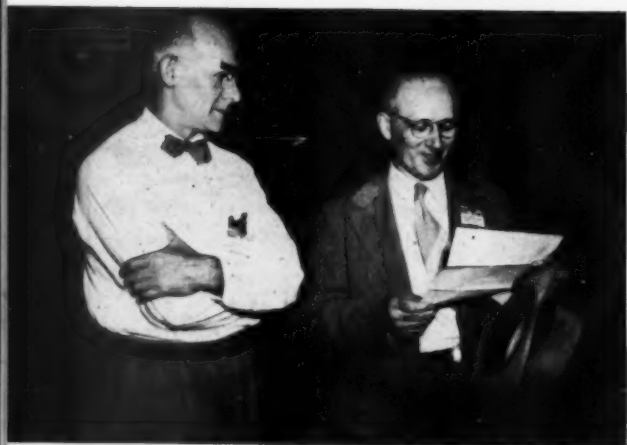
*Edw. Arter and D. G. Bennett*



*A. C. Francisco*



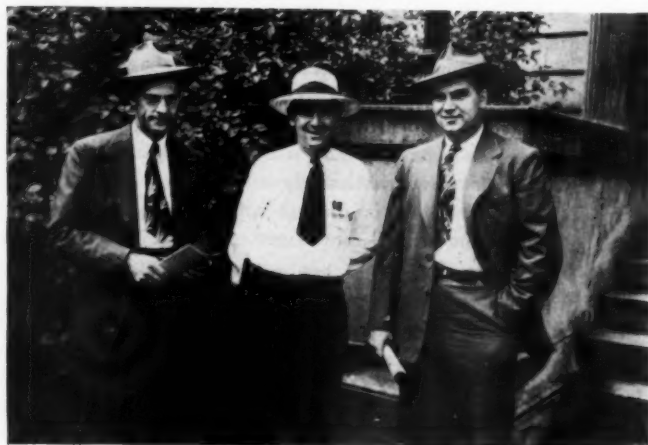




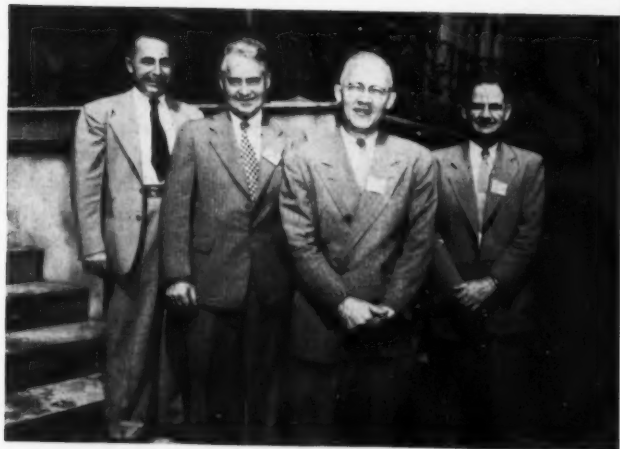
**SNAP**  
from  
**P. E. I.**

*See how many  
you can name.*

finishfotos



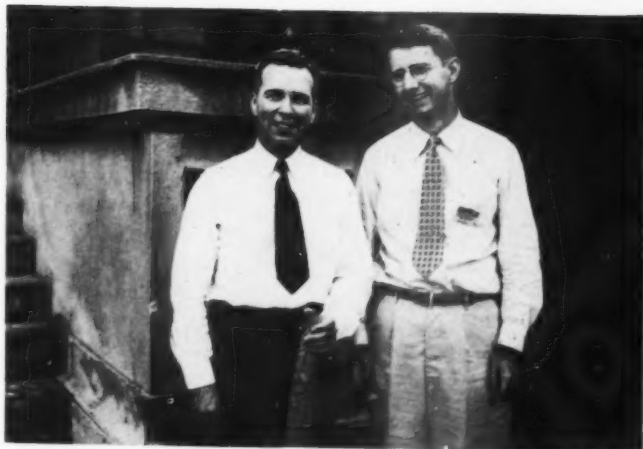




**P SHOTS**  
**m the**  
**I. FORUM**

*Then turn to  
page 57.*

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→ from Page 29

machine to maintain pH values and concentrations. The pH control on the nickel flash and nickel rinse sections is accomplished by a constant supply of concentrated sulfuric acid from an overhead storage bottle.

One of the advantages of this type of equipment is the improvement in working conditions and safety.

#### Operating costs

Due to present operating conditions and the fact that the equipment has been operated at about 50% capacity during the first six months, it is difficult to evaluate at this time

the actual pickling costs on a fair basis as compared with conventional pickling methods. During this operation period much experimental work necessarily had to be done and some minor changes made in the equipment which are reflected in the overall costs for this period. In spite of these conditions, only a slight increase in total pickle costs resulted and there is every reason to believe that a 15% or 20% saving in pickling costs is possible under our normal operating conditions. It must also be kept in mind that operating costs are to a large extent determined by the type of ware and size of pro-

duction runs.

Probably the best approach to the subject of costs is to show the relationship between pickling costs by the immersion and pressure spray method under the same conditions. First of all, I want to state that pickling costs alone were not the primary consideration of our management in authorizing the expenditure of approximately \$100,000.00 for the continuous pickling equipment. More important considerations at the time were (1) increased production per man hour and (2) more uniform and better cleaning. Both of these objectives have been obtained.

### Conventional pickle practice (EX)

By A. M. LANGBEIN

This paper shall endeavor to explain in as simple terms as possible the operations of a manually-operated pickling room, giving costs of installation (within limits of the records), type of equipment used, sequence of operation, cost of material, labor cost, number of square feet produced over a given period, number of hours worked in the given period, and a breakdown of labor and material cost per 100 square feet.

Wherever the term square feet is used in describing ware produced, we would like it understood that only the pattern size or face square feet is considered; thus, we mean that if a piece of ware has a face area of one square foot, 100 pieces would be produced to equal 100 square feet. If it has a face area of two square feet, 50 pieces would have to be produced to equal 100 square feet, and so on. At no time is the reverse side considered in computing costs.

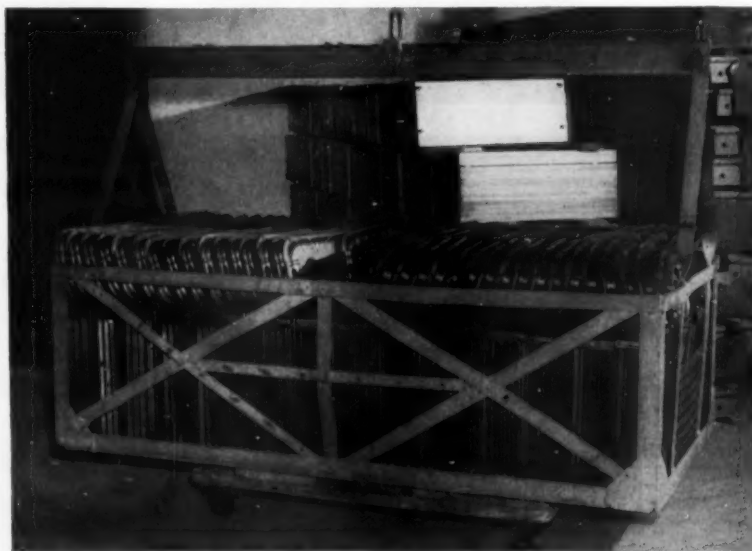
The type of materials prepared in this room are typical parts used in the manufacture of gas stoves, coal ranges and combination coal and gas ranges.

#### Room and equipment

The pickle room itself is 97½ feet long, 19½ feet wide and 15 feet high, and does not come up to what is ordinarily considered as a good room, but I make no apologies for it as it was constructed during the war time

restrictions in January, 1944. Notwithstanding all of this, the figures that will be used in this paper were compiled from the records of opera-

The pickling room during the period was in operation for approximately 10 to 12 hours daily, depending upon requirements. At the close



Typical loading of pickle basket for manual pickle room installation.

tion in this room during the last six months of 1946.

The hoist is of one-ton capacity, electrically controlled, with a motor drive through a speed reducer and cable for transverse operation.

Nine tanks are used, consisting of 2 alkaline tanks, 1 rinse tank, 2 acid tanks, 1 rinse tank, 1 nickel tank, 1 rinse tank, and 1 neutralizer tank. These are submerged about three-fourths the height into a concrete pit.

of the actual pickling period all water and steam valves are closed, to be opened again by an operator in time to start production operations at 7 a.m. This preheat period varies, depending upon the mean temperature and the length of down time.

To start the cycle, three basket loads are cleaned during the pickling period the night previous and are ready for the day operator. Of these,

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# From the Editor's mail . . .

"we don't agree with Mr. Sykes"

Dear Sirs:

"Shortage of a suitable steel for stampings is a vitally important subject to both the porcelain enameling industry and to the stamping industry. I notice that on page 33 of your August issue you quoted Mr. Sykes, President of the Inland Steel Company, and you include a statement that the big steel producers promise that by the end of the year they will be in a position to take care of all requirements.

"The stamping industry does not subscribe to the basis on which Mr. Sykes reaches his conclusions as to the amount of steel needed. Mr. Sykes has been quoted to the effect that he based his calculations on the per capita consumption of steel during the years between 1920 and 1940. A recent survey of its members, completed by the Pressed Metal Institute, disclosed that, although the stampers were today actually using as much, if not more steel as before the war, they are still 60% to 450% short of their requirements. This same survey disclosed many new uses for stampings and great increases in the use of many stampings that were made prior to the war. We are told that the present automobile requires 10% to 15% more sheet steel than the 1941 model. This means three to four hundred pounds per car. Multiply this by 5,000,000 cars per year and it amounts to a substantial increase in tonnage of sheet steel in this one industry alone.

"Another case of more direct interest to the porcelain enameling industry is the bath tub. A stamped steel bath tub was not generally sold prior to the war. Today it is being sold in quantities and there is every reason to believe that in the coming years it will replace the cast iron bath tubs in apartment houses, hotels and moderate priced homes. Each tub requires in the neighborhood of 150 pounds of sheet steel. There exists an annual potential market of 750,000 or more bath tubs for the next several years. The bath tub is a relatively new use for porcelain enameled sheet steel and a large tonnage may be needed for this purpose. The stamping industry therefore believes that the per capita consumption of sheet and strip steel over the next decade will be definitely greater than during the twenty years prior to the war. This is contingent upon sufficient quantities of sheet and strip steel being available through regular channels at reasonable prices."

**Ernest C. Morse**, Account Executive  
Lockhart International Inc.  
122 East 42 Street  
New York 17, N. Y.

reply to "the Finish Line," May, 1947, finish

Gentlemen:

"We have postponed taking exception to your editorial appearing in the May issue of 'finish' until we had suitable photographs available with which to supply you. At the National Housewares Show, held in Philadelphia the latter part of April, we introduced our new line of BETTSY ANN were illustrated by the enclosed photographs.

"The advanced styling, beauty and exceptional utility value of BETTSY ANN were readily recognized by home equipment editors of leading women's magazines. *Ladies' Home Journal* has informed us that they desire to use something in their September issue, *Better Homes & Gardens* plan to use something on BETTSY ANN were in their November issue, and *House & Gardens* have used advanced publicity in their trade publication, June issue, and request photographs of our BETTSY ANN Brideset for October issues.

"Over a year ago we introduced distinctively styled MEMCO ware . . .

"This company has long recognized the need of providing sales appeal beauty along with technical advancements not apparent to the homemaker's eyes. BETTSY ANN and MEMCO ware are intended for sale through leading department stores and other better stores throughout the country. All items of the line are available in either white with black trim or red with black trim having white interiors and are equipped with heat resistant, sure grip, black plastic handles and knobs. The long handles are equipped with hang-up stainless



steel rings. All items are individually packed for economical handling by sales clerks and the five-piece Brideset is packed as one complete unit.

"We eagerly look forward to seeing BETTSY ANN and MEMCO ware pictures in 'finish,' dependent of course upon the newsworthy significance you place upon the enclosed information. If we can be of any further assistance our cooperation will be promptly extended."

**Eugene C. Stark**, Sales Promotion Mgr.  
The Moore Enameling & Mfg. Co.  
West Lafayette, Ohio

In the editorial referred to by Mr. Stark, we pointed to the failure of kitchenware manufacturers to keep up with design trends, and took exception to the quality from an appearance standpoint, as displayed on sales floors.

## comments from readers

**Porcelain Metals Corp.**, Louisville, Ky.  
(Jobbing)

"We think Finish is tops. Always first with the latest developments in the industry and very easily digestible.

"Keep up the good work."

**Charles J. Kleinhans**, Process Control Engineer

**Day Brite Lighting Inc.**, St. Louis, Mo.  
(Lighting equipment)

"I appreciate receiving Finish very much. Especially helpful have been the articles on practical and technical problems. But every article is interesting and the illustrations can't be beat.

"Keep up your excellent editorials. Enamel men are prone to think their product is so good it can't be improved. This kind of thinking can be fatal."

**Robert O. Cox**, Foreman in Charge of Control

**Associated Engineers, Inc.**, Fort Wayne, Indiana  
(Management Counsel)

"We wish to congratulate you on your editorial in the August issue of Finish in which you advo-

cated the use of porcelain enamel. Our architectural department has had the occasion to recommend its use in several instances and plans to include it in the specifications of a structure now pending."

**Louis H. Vehen**, Secretary

**Norge Division, Borg-Warner Corporation**,  
Muskegon Heights, Michigan  
(Refrigerators)

"We like Finish, particularly your write-ups on plant visitations. Your editorials keep one informed on what to look forward to and keep one well up on his toes.

"Keep Finish alive and up to date."

**J. C. Scharmer**, Process Control Supervisor

**The Quincy Stove & Mfg. Co.**, Quincy, Illinois  
(Stoves)

"Your publication is of the highest type and I read it from cover to cover and find many interesting and useful articles in it. I certainly would not want to be without it. I hope you continue the good work."

**Clyde H. Seiz**, Supt. of Porcelain Enamel Dept.

**Mullins Mfg. Corp.**, Warren, Ohio  
(Kitchen equipment)

"We enjoy Finish very much and feel that those responsible are doing an excellent job. Finish is by far the most interesting of all the publications."

**H. M. Dowds**, Enameling Supt.

**General Electric Co.**, Erie, Pa.  
(Refrigerators)

"I am enjoying your publication very much and want to thank you for your kindness in sending it to me. I wouldn't want to miss your up to date information and data.

"My wife enjoys it as much as I do."

**August W. Moyer**, Asst. General Foreman

**Frigidaire**, Dayton, Ohio  
(Refrigerators, electric ranges, washers)

"This type work is new to me, and I have found a lot of the items contained in your magazine of much interest to me."

**Harry Kunkleman**, General Foreman of Production

**Seeger Refrigerator Co.**, Evansville, Indiana  
(Refrigerators)

"I find Finish very helpful in its presentations and solutions of enameling problems."

**Kenneth Lutz**, Supervisor, Porcelain Division

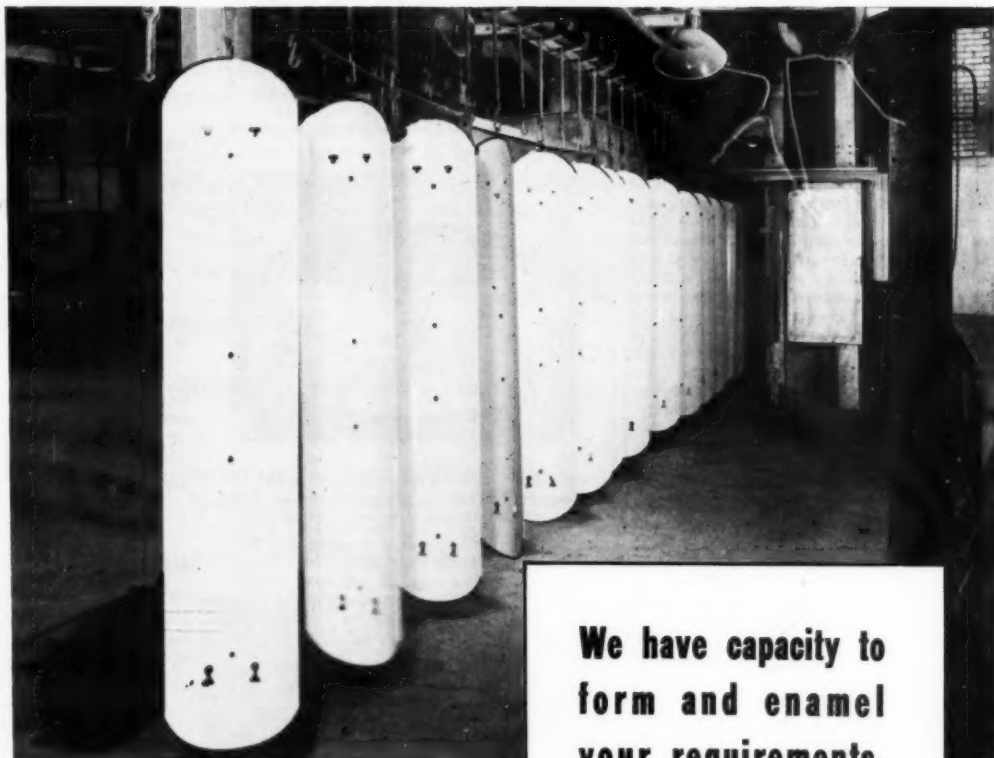
**General Electric Co.**, Bridgeport, Conn.  
(Home laundry equipment)

"Just keep the magazine as fine as it has always been, full of news of the industry and shop practice, etc."

**A. M. Sweeney**, Mgr. of Sales: Major Appliances



# HOW ABOUT REFLECTORS?



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form and enamel  
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You can be sure of VITREO quality and reflectance because there has been a steady stream of reflectors going through our plant ever since VJ Day.

In some cases, we form and enamel reflectors. For other customers, we enamel their black iron shapes.

Until steel is more available, we must ask you to supply the metal. Enameling stock is preferred, of course. We have, however, done some thoroughly satisfactory jobs on cold rolled.

We usually can save you time and money, and avoid possible damage, by delivering in our own trucks. May we quote?

**VITREOUS STEEL PRODUCTS CO.**

BOX 1791, CLEVELAND 5, OHIO (Factory at Nappanee, Ind.)



# The Washington round-up

*By Wilfrid Redmond*

THIS period in our economy is known as the "Marshall Plan Gap" in Washington. All departments of the Government are engaged in gathering data upon which to base estimated requirements of the Marshall plan. Some of the reported figures are fantastic, so much so that the Capital has grown a bit jittery about the implications of the drain upon our resources. In Government offices and press rooms there is much talk about the return of production and price controls.

Although the majority opinion seems to be that we should do something to save the European nations from starving and falling into the Soviet orbit, there is also a sizable minority which refers to the Marshall plan as "Operation Rathole" and maintains the European peoples will not make an all-out effort to help themselves as long as they are spoon-fed by Uncle Sam.

The average businessman, and for that matter, most Americans, are already beginning to get a confused picture of the Marshall Plan because politicians keeping bobbing up in the foreground. The Administration is making studies and will shortly announce what we will have to do to meet the requirements of the Marshall plan. Mr. Taft says nothing can be done now, that a special session is out of the question, because nobody knows what Europe needs.

It is a sure bet that if the program is delayed until the political issues involved are thoroughly aired, the peoples of Europe will be hungry and cold, and have definite communistic leanings.

At the moment, the discussion centers around the need for a special session of Congress this fall, to work out an interim program for additional relief for the countries that will eventually take part in the Marshall plan. Two State Department officials have made public statements urging President Truman to convene Congress again before the regular ses-

sion. These statements were undoubtedly made to get the reaction of the country. The public opinion polls indicate that the majority of Americans want to keep the western Europeans from falling under the sickle and hammer of Soviet Russia. The best information indicates that the President's Council of Economic Advisers will have some figures ready in about two weeks upon which Mr. Truman may base a decision as to whether a special session is urgent. The State Department evidently thinks it is, as of now, and the State Department prevails where matters of foreign economic policy are concerned.

Although the opposition has not yet begun to bring up its guns, the opinion is generally held that a special session will be called for around November 1, unless the situation in Europe shows improvement. It is also now believed that such a session should proceed to work on the Marshall plan instead of an interim program. In fact, most economists think that Congress should be in session now working on the problem instead of seeing the world like Navy recruits.

If the Marshall Plan is approved by Congress it will mean a sizable increase in our exports of basic commodities like wheat and steel, and shortages at home. Most economists do not see how we can avoid reinstatement of allocation and priority powers of the Government and price controls. Steel for instance, is already in tight supply. New demands upon steel capacity will inevitably cause greater shortages in domestic supply. Even the heaviest steel user, the automobile industry, is complaining of short supplies now, and many small manufacturers have maintained that they are unable to get any steel. The Senate Small Business Steel Subcommittee says the steel producers are already exporting too much of their product. The Subcommittee has called the steel producers down to Washington to confer upon the prob-

lem of improving some of their distribution practices. The Subcommittee is expected to recommend relaxation of the historical use plan of distribution which the Subcommittee claims works a hardship on newcomers in the manufacturing industries. Also, the steel producers will probably be urged to divert some of their steel from integrated mills to the general market. The Subcommittee will make these and other recommendations to the steel industry. Subcommittee staff members are emphatic in their forecast that if the industry does not follow the recommendations, legislation will be urged in the next session to regulate distribution of steel products.

The Marshall plan is recognized by all concerned as a hot potato for an election year. It may blow many a candidate sky high. The Administration particularly is in the middle of a ticklish situation in that greatly increased exports will mean domestic shortages and high prices. The electorate may have different views in different sections about feeding Europe and candidates will have to be especially sensitive to the public will.

## FTC moves against Big Steel

The Steel industry finds itself fighting the Government on two fronts. Already engaged in a discussion with the Senate Small Business Subcommittee about faulty distribution practices, the industry has been attacked head-on by FTC in a complaint charging a conspiracy to fix and maintain identical price quotations and destroy competition in the sale of iron and steel products.

FTC charges that the present multiple basing point system used by the industry insures "the same identity of delivered prices as though the industry were operating under a single basing point system" and "as though all mills were under one ownership and control."

The system which destroys price competition, FTC says, deprives purchasers of the advantage which, except for the conspiracy, would accrue to them as a result of their proximity to the plants of the producers, and which requires purchasers to pay increases over what the net prices would

have been had they been fixed by competition.

The complaint, which names the American Iron and Steel Institute, and all important iron and steel producers, gives the industry until October 8 to return a formal answer. Steel industrialists, however, issued statements immediately terming the complaint ridiculous and contending that the basing point system is the only equitable method of pricing which the industry has been able to work out. The complaint promises to drag out for some time. FTC now has pending a case against the steel industry for its Pittsburgh basing point system which was started in the 1920's.

#### Antimony control relaxed

The Office of Materials Distribution, Department of Commerce, recently announced that antimony supplies are currently sufficient to meet domestic requirements, and that producers would no longer be required to apply for permission to ship the metal. Authorizations to accept deliveries of antimony will be checked against reports of shipments by producers, distributors, and importers. While it is believed that over-all shortages will again develop, OMD believes that control of receipts alone will prove adequate, and will eliminate much of the paper work of a dual authorization system.

The applicant also is no longer required to name his supplier. Upon receipt of his authorization he is free to buy the material from any commercial source he wishes. OMD will not arrange for deliveries from RFC stocks unless satisfied that the antimony cannot be obtained otherwise.

#### Tin stocks decline

The Department of Commerce recently announced that stocks of tin continued their downward trend during the second quarter and that consumption of tin will be permitted to remain at approximately first and second quarter levels for the remainder of the year.

Total reduction of tin stocks has been over 12,000 tons since the first of the year and over 25,000 tons since

July 1, 1946. The sharp decline during the second quarter will be partly arrested during the third quarter by the arrival of a considerable tonnage of pig tin enroute to the U. S.

Imports of new tin during the second quarter amounted to 6,581 tons. In addition, domestic production of pig tin from detinning tinplate scrap and used cans amounted to 675 tons and receipts of tin alloy scrap totalled 5,689 tons, making total available supplies during the quarter 12,945 tons.

At the same time consumption totalled 21,536 tons during the second quarter compared with 22,780 tons in the first quarter. Significant during the second quarter was the falling off in almost all categories of consumption except tinplate. Sharp declines occurred in consumption of tin for copper base alloys, solder, and bearing metal, indicating that the peak demand for these items within the limit imposed by controls has passed and that pipelines have to a large extent been filled.

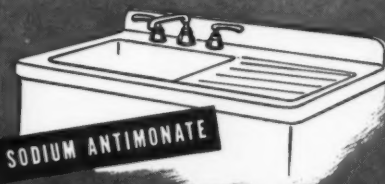
Anticipated deficits in new supply will be absorbed by the remaining Government stocks.

American manufacturers have been invited by the Office of Technical Services, Department of Commerce, to examine two German machines, an automatic mechanical press for dry pressing steatite ceramics, and a combination spot welding and impact press for fastening metals parts to ceramics. The two machines are on exhibit through September 30, 1947, at the plant of the American Lava Corporation, Manufacturers Road, Chattanooga, Tennessee. OTS also announced that a report (PB-6494; High Frequency Ceramic Materials of Germany), describing the two machines in considerable detail and also other developments noted by Dr. Hans Thurnauer, vice-president and research director for the American Lava Corporation, during a German investigation, is on sale by OTS. Orders should be addressed to OTS, Department of Commerce, Washington 25, D. C.



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- true white color
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- high strength
- maximum adhesion
- uniform high quality



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# NEWS

V. A. Burdett, President of Burdett Manufacturing Company, announces the addition of Charles H. Scheele to the organization.

## Burdett executive promotions

Burdett Manufacturing Company, Chicago, announces the promotion of Donald C. Scheele, as general and sales manager, and Robert B. McCormick, as treasurer.

Scheele, an engineer with Burdett for nine years, was graduated from the University of Illinois with a B.S. degree in mechanical engineering. McCormick is a grandson of the late J. B. Burdett, founder of the firm which manufactures infra-red gas-fired burners.

Philip G. (Jerry) Boyd, for six years district sales manager for The Youngstown Sheet & Tube Company at Washington, D.C., has been appointed assistant district sales manager of the Chicago area.

## Gould accepts O. Hommel position

James Gould, who has had a five-year vacation from the enamel industry, accepted a position with the O. Hommel Company. Just prior to his new connection, Gould was purchasing agent for Hugh H. Eby, Inc., Philadelphia, Penn.

## Titanium Alloy adopts group insurance

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has announced the adoption of an employees' group insurance plan which provides weekly benefits for accident and health disability for employees and surgical operation insurance for

employees and their dependents. The plan is underwritten by the Metropolitan Life Insurance Company, it was reported.

## Dobson heads Florence Stove



Edward F. Dobson was elected president and director of the Florence Stove Company at a recent meeting of the board of directors. He succeeds Robert L. Fowler who will continue as chairman of the board. The new president takes office October 1.

Before joining the Florence Stove Company, Dobson was president of Rundle Manufacturing Company, Milwaukee, Wis., and Camden, N. J. His career in the field of manufacturing brought him in contact with many phases of factory production and operation.

The Youngstown Sheet and Tube Company recently presented a 40-

year service emblem to E. E. Erven of the company's district sales department in Chicago.

## Roberts & Mander executive dies

John H. Emery, vice president of Roberts & Mander Corporation, Hatboro, Penn., died at the Orange (N. J.) Memorial Hospital, August 24, after an illness of several weeks. He was 49 years old.

Emery joined Roberts & Mander Corporation in 1945 as district manager of the New York office. Last February he was made vice president of the firm. Born in Bedford, Ind., Emery was graduated from the Engineering School of the University of Michigan in 1919. Shortly thereafter he became the eastern sales manager of the Sullivan Machinery Company, Buffalo, N. Y.

H. E. Angier, with the Conlon Corporation, Chicago, since 1933, has been made comptroller of the successor concern, the Conlon-Moore Corporation. He continues his duties as assistant secretary and treasurer of the concern.

## Market research on washers

An automatic washing machine will be bought by 56 per cent of the families reporting that they planned to buy a washer, Dun and Bradstreet's research division determined in a recent nationwide survey, according to Harlow K. Lyons, director of distribution and market research for Bendix Home Appliances, Inc.

## Spring joins Pennsalt research and development division

Samuel Spring, formerly a research specialist for the Government, has been appointed to the research and development staff of the Pennsylvania Salt Manufacturing Company, according to a recent report. Spring will have charge of the inorganic research group at Pennsalt's White-marsh Research Laboratories.

A native of New York City and a graduate of the College of the City of

New York, Spring received his master's degree at Columbia University. For two years he served on the faculty of City College of New York and later became associated with Frank-

ford Arsenal where he supervised research on metal cleaners and metal-working lubricants for the past seven years.

#### EUMC technical committee meets



The fifth general technical committee meeting of the Enameled Utensil Manufacturers' Council was held at the Department of Ceramic Engineering, University of Illinois, Urbana, July 30, 31 and August 1.

Included on the program were the following speeches: "Titanium Enamels," by A. L. Friedberg; "Water Lines," by W. D. Fitzpatrick; "Fuels for American Industry," by Dr. W. H. Voskuil, and "Pyrometric Practice and Automatic Control," by A. W. Allen.

Most of those in attendance at the

meeting are shown in the accompanying picture. Left to right, front row, are: P. A. Huppert, R. L. Cook, J. C. Vollrath, W. L. Housley, L. Ashby, H. M. Zimmerman and A. I. Andrews. Second row: B. Kirk, E. C. Dexheimer, G. A. Foehse, M. H. Whitehead and F. W. Nelson. Third row: H. C. Arnold, J. Lochridge, P. Stratton, E. H. Kelsey, A. L. Friedberg and W. Gates. Fourth row: G. H. Zink, S. Chambers, P. A. Mallonn, H. Russell, H. L. Latimer and F. A. Petersen. Fifth row: E. A. Schwarz, P. Cecil and F. Fletcher.

#### Bendix automatic washer production reaches 1,000,000

A gold and silver-plated automatic washer, Bendix No. 1,000,000, was unveiled at a four-day convention of Bendix Home Appliances, Inc. executives and distributorship personnel at South Bend, Indiana, August 21-24. The handsomely plated washer will be presented to the Edison Institute, Dearborn, Mich., this fall.

The first Bendix automatic washer, shipped September 27, 1937, was also on exhibition. It is in fine running

order after 10 years of service in the Ruston, La., high school, according to a Bendix report.

During the convention, W. F. Linville, general sales manager for Bendix, stated that if current production levels are maintained, the firm's 1947 output of automatic washers will reach 650,000.

#### Merchandise Mart appointment

Bert J. Lange, until recently the secretary of the Home Furnishing

Style Council, New York, has begun his new duties at the Merchandise Mart, Chicago, as a special sales development executive, Wallace O. Ollman, general manager of the Mart announced. Ollman developed the BLIF (Basic Home Furnishings) Program which is widely accepted by leading home-furnishings manufacturers.

#### Norge announces first postwar national sales convention

The Norge division of Borg-Warner Corp. will hold its first national sales convention since 1939 on January 3, 1948, at the Continental Hotel in Chicago, according to M. G. O'Harra, vice president and director of sales.

O'Harra said the meeting would be conducted in connection with the Midwinter Furniture Market which opens January 7.

#### Battelle Institute names six new assistant directors



*Assistant Director Sullivan*

To assure full utilization of the talents of its growing staff, Battelle Memorial Institute, Columbus, Ohio, has named six new assistant directors. They are Dr. Frank C. Croxton, Dr. Clarence H. Lorig, Dr. Howard W. Russell, Ralph A. Sherman, Clarence E. Sims and John D. Sullivan.

These men will share with Clyde Williams, director, and Dr. Oscar E. Harder, assistant director since 1930,

in the technical direction of Battelle research.

Sullivan is president of the American Ceramic Society. He is also a member of a number of other technical societies, including the American Foundrymen's Association, the American Institute of Mining and Metallurgical Engineers, the American Society for Testing Materials, and the Electrochemical Society. A graduate of the University of Washington, he joined the Battelle staff in 1933.

#### Increase in shipment value of porcelain enameled products

More than \$7,000,000 worth of porcelain enameled products were shipped during June, 1947, according to a report of the Porcelain Enamel Institute. This figure represents an increase of approximately \$2,000,000 over the shipment value for June, 1946, and an increase of more than \$4,000,000 over the value for June, 1945, according to the Institute statement.

Signs, washing machine parts, store fronts and other architectural porcelain enameled products showed slight shipment value increases over figures reported for May, 1947, while

reflectors, table tops, and stove and refrigerator parts showed slight decreases when compared with May figures. (Values for stove, refrigerator

and washing machine parts do not include parts produced and assembled into complete end products by the same company.)

#### Duo-Therm's new plant in operation



The first step towards a greatly expanded production output was taken by Duo-Therm recently when the first fuel oil space heater came off the assembly line in the company's new plant in Lansing, Michigan, according to a company report. (See page 53, September, 1947, finish.)

Although only one space heater line is now in operation, no less than four

assembly lines will be in simultaneous operation when full production is reached. The report stated that these four lines will be a circulating heater line, a trailer heater and "Radiant-Circulator" line, a furnace line and a water heater line.

Since purchasing the new plant, Duo-Therm, a division of Motor

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#### Air marking hits the comic strips

COURTESY CHICAGO TRIBUNE-NEW YORK NEWS SYNDICATE, INC.

Wed. Aug. 20, 1947

#### SMILIN' JACK—FOR SAFER FLYING



Finish has been cooperating with C.A.A., C.A.P., Air Power Clubs, etc., in attempting to broaden the use of permanent air markers as an aid to pilots on non-scheduled flights. (See May and June, 1947, issues of finish—more to come.)

Therefore, we were interested in seeing the "Smilin' Jack" comic strip, in *The Chicago Tribune*, August 20, carry a strong plea for twice as many airway weather stations, many more airports, and an adequate air marker for every town.

Here's an opportunity for the porcelain enameling industry to play an important part in reaching the latter objective. With porcelain enameled markers, visibility will be greatly increased, and the markers will be permanently visible without upkeep costs.



→ from Page 41

Wheel Corporation, has moved in the latest type of production equipment, and has laid out the more than a half million square feet of floor space to provide precision straightline manufacturing operation throughout. This straightline production is facilitated through the use of miles of conveyor lines. There are 1¼ miles of over-

head conveyors alone, comprising seven separate lines. In addition, there are nine platform conveyors and 15 belt conveyors.

"Start of production in our new plant represents the culmination of a three-million dollar expansion program," stated M. F. Cotes, general manager of Duo-Therm and executive vice president of Motor Wheel.

vice president, Boston Consolidated Gas Company, and chairman of the A.G.A. National Advertising Copy Committee.

Results of the comprehensive gas industry Promotion and Research Plan to date will be outlined as the closing event of the convention.

The President's Reception and Dance, with entertainment features, has been arranged for Monday night, October 6.

### Stage set for AGA Convention in Cleveland

The attention of the gas industry will be focused on Cleveland, Ohio, this month when several thousand key men attend the 29th annual convention of the American Gas Association to be held in the Cleveland Auditorium, October 6-8.

"Gas Has Got It," theme of the convention, ties in with the Association's national coordinated promotional program which will be in full progress as the meeting gets under way.

Problems of broad managerial interest will be covered at the morning general sessions while detailed operating problems will be handled at the afternoon sectional meetings.

J. French Robinson, president, The East Ohio Gas Co., and a past president of the Association, is head of the convention's arrangements committee.

R. H. Hargrove, president of the Association, and recently elected president of the Texas Eastern Transmission Co., will preside at the opening session, Monday morning. He is expected to discuss the industry's assets and accomplishments.

Following an official welcome to Cleveland by Mayor Thomas A. Burke, the convention will get down to business.

C. M. White, president, Republic Steel Corporation, will discuss the supply and allocation of steel, directing his remarks to the specific requirements of the gas industry. The initial session will also include reports by Association officers and the election of officers for next year.

Tuesday has been set aside as R. W. Gallagher Day, in honor of the first chairman of the Laboratories' Managing Committee. Gallagher also

is an A.G.A. past president. The day's program will include an address by D. P. O'Keefe, president, Gas Appliance Manufacturers' Association, and the presentation of awards for outstanding individual achievements.

The final general session, Wednesday morning, will open with a speech, "Gas Has Got It," by J. J. Quinn,

### Clarence Anderson seriously injured in plane crash



finishfoto

Clarence Anderson, executive vice president and sales manager of New Monarch Machine & Stamping Company, Des Moines, Iowa, suffered serious injuries in a plane crash at the Port O' Wilds airport north of Bemidji, Minnesota, Sunday, August 10. Anderson, together with Lee Shelton, also of New Monarch, a third passenger and Stuart M. Sawdy, pilot, were taking off in a Stinson "150" from the Port O' Wilds airport when the crash occurred.

After gaining an altitude of approximately 150 feet during an abso-

lutely "still" afternoon, the plane failed to gain further altitude and an attempt was made to return to the port for a successful landing. The crash occurred just short of the airport runway. The only two seriously injured were Anderson and Sawdy.

After temporary hospitalization, Clarence Anderson was returned to a Des Moines hospital, where he

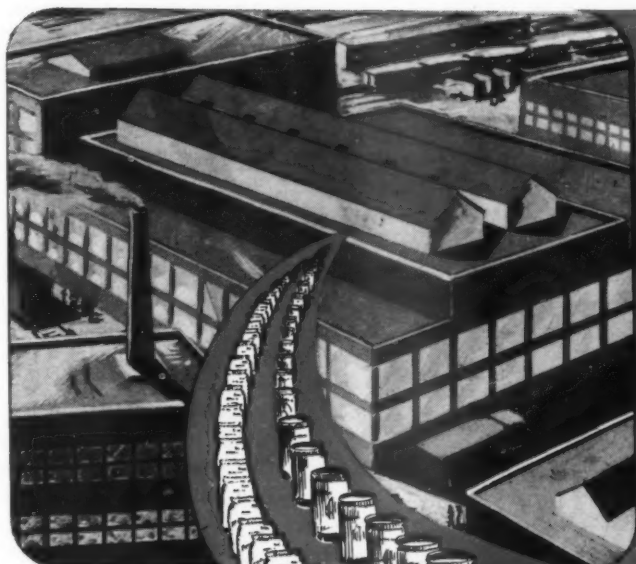


underwent a successful back operation. His friends will be pleased to hear that latest reports indicate that he is rapidly recovering.

### Philco expands in refrigeration field by acquiring Rex Company

The production facilities and all other assets of the Rex Manufacturing Company, Inc., Connersville,





.... what makes  
a good  
**ENAMELER'S  
SUPPLY  
HOUSE?**

**Is it size?**

## ANSWER—

A ceramic supplier with a manufacturer's "viewpoint" who can deliver porcelain enamel frit, powdered clay, oxides, and supplies that make the best finished product and keep the manufacturer's re-operation cost to a minimum.

### Laboratory Controlled Production of Ceramic Supplies

- FRIT for Steel, Cast Iron or Pottery
- CERAMIC COLORS
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- BRONZE POWDERS
- METAL POWDERS
- SUPPLIES
- EQUIPMENT

Our Technical Staff and Samples are available to you without obligation. Let us help you with your problems.

*World's Most Complete Ceramic Supplier*

**THE  
O. HOMMEL CO.**  
PITTSBURGH 30, PA.  
Pacific Coast Agents  
L. H. BUTCHER CO.

Ind., are being acquired by the Philco Corporation, according to John Ballantyne, president of Philco.

For the past several years, Philco has purchased the entire refrigerator output of the Rex Company which will continue operations without any change under the direction of the present executive management.

The facilities of the Rex plants, combined with the new Philco refrigerator-freezer plant in Philadelphia, will give Philco a refrigerator

production capacity several times as great as in 1941, it was announced.

#### Fred Doering to West Coast position

Announcement comes to finish that Fred Doering is joining the organization of James Graham Manufacturing Company, Newark, California, following a quarter of a century with Cribben and Sexton Company, Chicago, where until his recent change he was general superintendent. Fred

reports he will be head over heels in enameling again, spending his entire time at first in the enameling plant where the Graham facilities are to be enlarged and modernized.

Doering is well known to enamellers through close association with the Chicago District Enamellers Club and activity in national Forum meetings, etc. He joined Cribben and Sexton in 1923, as electrician. He was advanced to master mechanic a year later, and in 1934 was appointed enamel shop superintendent. He relinquished this position in 1941 to lay out and install a 105 mm shell manufacturing department. In July of 1943 he was appointed general superintendent.

While enamellers in the Midwest will regret seeing Fred leave for the West Coast, we are sure each and every one of them will wish him the best of success in his new position.

#### Emily Van Schoick to position at Alfred University



Miss Emily C. Van Schoick, associated with the American Ceramic Society in Columbus, Ohio, for more than 25 years, has been appointed to the newly created position of librarian of the New York State College of Ceramics at Alfred University. She assumed her new duties September 10.

In announcing the appointment, Dr. Samuel R. Scholes, dean of the college, said that this year the library will build up its collection of

to Page 54 →



**A** compactly built instrument ( $1\frac{1}{8}'' \times 2\frac{3}{4}''$  switch case). Power element consists of a stainless steel diaphragm with capillary tube and bulb filled with a liquid with high co-efficient of expansion. Action is sensitive and powerful. No resilient parts are interposed between power elements and contacts. Therefore, positive break is obtained when power element expands. Standard temperature range 150° to 550°. Can be obtained in "direct" and "reverse" action models in eight temperature ranges to meet appliance needs.

### Robertshaw Electric Thermostats

are available in a wide variety of mechanical snap-action models for commercial and light industrial uses as well as for household appliances. They are also available in combination with limiting switch, automatic over-temperature cutout and manual reset.

Write for bulletins and complete information.

**ROBERTSHAW**  
THERMOSTAT COMPANY • Youngwood, Pa.



# VITRO

## Colors

QUALITY

### VITRO TITANE

This special formula titanium compound is designed for use in porcelain enamel cover coats to promote high opacity. It is acid resistant.

### SCREENING COLORS

Our screening colors in paste form are available to meet a wide range of requirements for decorating and marking. Send your screening color problems to VITRO.

Colors — well chosen, permanent colors — can be one of your most useful selling aids. Table tops, architectural porcelain, signs, kitchen utensils, sanitary ware, and appliances can enjoy permanent sales benefit of color when VITRO colors are used. Colors by VITRO are scientifically compounded, produced under the most careful laboratory control, and then tested exhaustively before they are released for production.

The name VITRO stands for quality, experience and service — based on over forty years' experience as color specialists. Your product can benefit from this experience if you use VITRO quality colors.



## THE VITRO MFG. CO.

Corliss Station,

PITTSBURGH, PA.

Branch Plant  
Canonsburg, Pa.

California Office:  
16 California St., San Francisco, Calif.

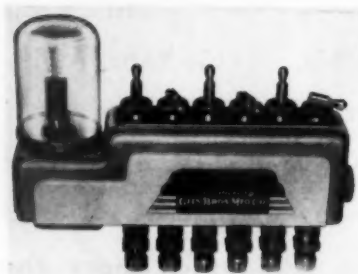
## New Supplies and Equipment

### High precision source unit for spectrochemical analysis

A new source unit, designed specifically for high quantitative precision and accuracy, and which has been tested by the latest direct-reading, photoelectric instrument, the quantumeter, has just been placed on the market by Applied Research Laboratories.

The unit provides two basic spectrum sources—one of high voltage and frequency used for the higher percentage determinations, and one of low voltage and frequency used for lower percentage analyses. Literature describing the instrument in detail is now available from Applied Research Laboratories, 7707 Michigan Avenue, Detroit 10, Michigan.

### "Constant level" oiler system



A Chicago company has announced a new multiple oiler said to be capable of solving the oiling problem in a wide variety of situations in both small shops and large installations.

It is a centralized unit made up of a transparent reservoir of unbreakable plastic with a non-spill valve and a main reservoir from which copper tubes lead to the various remote oiling points.

The unprecedented demand, already recorded, which this oiler is designed to meet, is probably due to the two-way compulsion put on plant owners. In the first place, the shortage of skilled personnel, and the constant shifting about of machine operators, has made the supervision of machine care difficult. Secondly, plant owners, many of whom are en-

tering the post-war era with worn machinery, are faced with phenomenally high prices and long delays on repairs and replacements. As a result they have come to rely to a great extent on mechanical oiling systems, such as the Gits style "GM" described here, which require infinitely less care, and are economical in both cost and maintenance.

For complete information, write direct to the Gits Brothers Mfg. Co., 1846 So. Kilbourne Ave., Chicago, Ill.

### Sign reflector



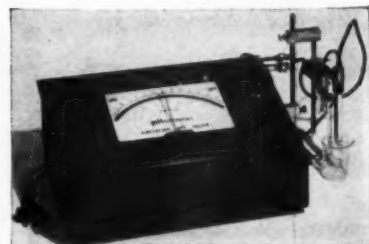
Noteworthy in the field of sign lighting is an improved sign reflector which is finished in porcelain enamel, is weatherproof and easy to clean.

Designed especially for illuminating square or rectangular signs, this Keystone reflector, manufactured by the Goodrich Electric Company of Chicago, insures maximum intensity without waste of light. The shape and straight side lines of the reflector provide light cut off at the exact edges of the sign.

By adjusting the distance between reflector and sign, the light pattern is readily "tailored" to fit the sign, assuring uniform distribution of light over the entire surface.

This sign reflector is equipped with a right angle hood which can be mounted on a straight piece of conduit, and may be attached or detached without the use of screws. It is equipped with a resilient socket which cushions the lamp against vibration. The reflector is available in three sizes, accommodating lamps of from 60 to 150 watts.

### Line-operated electronic pH meter



A new line-operated electronic pH meter, equipped with a 7-inch scale and mirror for convenient readings and high precision, is now offered by the Photovolt Corporation, 95 Madison Avenue, New York 16, N. Y.

The instrument operates directly on any AC power line of 50-60 cycle frequency. A voltage selector is provided to make it useable on any voltage between 90 and 275 volts. The dial, in addition to the pH scale, is equipped with a millivolt scale from minus 400 to plus 400 millivolts. The meter covers the complete pH range, no reversal switch being required.

### Permanent non-electric magnetic pulley



A completely self-energized magnetic pulley requiring no electric current to generate a magnetic field is now being commercially produced by the Eriez Manufacturing Co., Erie, Penn. The pulley is said to be adaptable to all applications requiring automatic separation of magnetic from non-magnetic materials such as frit, dry enamel, clay, etc., conveyed on a belt.

For complete information, write for Bulletin 501-A, Eriez Manufacturing Co., 2604 East 12th Street, Erie, Penn.



# COMPLETE *Finishing* SYSTEMS

for ENAMEL • LACQUER • PAINT



Above: A Large Cold Display Case leaving the Dry-off Oven in the Complete Mahon Finishing System of the Hussmann-Ligonier Plant, St. Louis, Mo. At Right: General view of the Same Installation Showing Diversity of Parts and Products Handled. Note Up-Tunnel to Finish Drying Oven Located on Roof of Plant.



Typical Mahon Hydro-Filter Spray Booths in the Hussmann-Ligonier Installation. Swivel Attachments on Conveyor Line Permit Turning and Painting of Both Sides of Cases Twelve Feet Long. Parts Seven Feet in Height are also Handled in the Same Mahon Spray Booths.



Mahon Finish Drying Oven—Part of the Hussmann-Ligonier Installation—is located on the Roof of the Plant to Conserve Valuable Manufacturing Floor Space.

## Mahon Meets Exacting Requirements of Hussmann-Ligonier Company

The Mahon Finishing System illustrated here is an unusual installation due to the wide diversity of sizes and shapes of parts and products handled—and, the requirements of the finishing process being the most exacting in the industry . . . exacting, because of the extreme conditions of grease and humidity under which products like cold display cases serve in butcher shops, and the extreme low temperatures, humidity and corrosive elements ever present in ice cream cabinets in commercial use. It is only natural that the Hussmann-Ligonier Company should turn to Mahon for equipment to meet these exacting requirements in product finish, because, over twenty-five years' experience in this highly specialized field has endowed Mahon engineers with a wealth of technical knowledge and practical know-how not available elsewhere. See Mahon Insert in Sweet's Mechanical Industries File, or

Address INDUSTRIAL EQUIPMENT DIVISION

THE R. C. MAHON COMPANY

HOME OFFICE and PLANT, Detroit 11, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems including: Metal Cleaning Machines, Rust Proofing Machines, Dry-off Ovens, Hydro-Filter Spray Booths, Filtered Air Supply Units, and Drying and Baking Ovens. Also Paint Reclaiming Units, Hydro-Foam Dust Collectors, and many other Units of Special Production Equipment.

# MAHON

## Economics and maintenance of industrial lighting systems

(Continued from Page 17)

than it is for lamps which fail at about 2500 hours of operation. In the case of the two-shift operation the estimated over-all cost is 108 x \$19.50 or \$2110. A study of these two over-all costs, due to operating conditions for each type of equipment, readily reveals the logical conclusion that for the longer hours of burning per year there is a lower unit cost of light. For example, for the one-shift operation, the 50 foot-candles for 2500 hours per year over the entire 8,000 sq. ft., and with an electric energy rate of one cent per kwhr., would cost 1.3 cents per foot-candle hour, while for 4,000 hours per year the cost would be 1.05 cents per foot-candle hour. For this example, the unit costs would, of course, be greater for higher energy rates, and the differential between them would be slightly less pronounced.

### Comments on Table I

The slimline lamp is a relative newcomer in the field of industrial lighting. The lamps are long and somewhat smaller in diameter than the general line of fluorescent lamps. The lamp considered in this analysis is the 96-inch T8 and consumes 51 watts when operated at 200 ma. One of the advantages in the use of this lamp is that it provides instant-start operation at an over-all efficiency of lamp and ballast which is slightly better than the pre-heat start 40-watt lamp. Also, since they provide 3200 lumens each, compared to 2300 for the 40-watt lamp, a fewer number of Slimline lamps, and therefore 8' luminaires, will be required. This means, for our example, that in comparison to 100 units of the 40-watt pre-heat start type only 77 of these industrial Slimline units would be used. For the slimline equipment, an open-end industrial type reflector with baked enamel finish suitably designed for four lamps placed parallel is attached to a channel that houses the ballasts and wiring. These four-lamp units can be mounted about thirteen feet above the floor to give uniform

distribution, and arranged in continuous rows on thirteen-foot centers, or it may be desirable for standard 20' x 20' bays to install them in a grid pattern with four units arranged in an open square. In the latter case, the quality of lighting would be even better than with the continuous row system since with this pattern there is more freedom from shadows on the work surface.

Practical considerations such as difficulty of reaching equipment, replacement of lamps, and cleaning of luminaires should be paramount for all industrial lighting systems. In this respect it is usually desirable to think in terms of the fewest number of units to be cleaned, and the fewest number of lamps to be replaced. As higher mounting heights are encountered, these practical considerations often dictate the use of higher lumen output sources, such as filament and mercury lamps.

Both the 400-watt and 3000-watt mercury lamps have received particular attention for use in high-bay areas where it was desired to do as good a lighting job as possible with minimum installation and maintenance costs. The delayed re-starting characteristic of the mercury lamp has led to the rather wide acceptance of a combination mercury and filament system. In other words, if for any reason (such as power interruption) the mercury lamps go out during operation, they will not come back on again for a few minutes so that during this period there would be no artificial lighting in the plant if it is lighted only by mercury lamps. Filament lamps are, therefore, frequently used in an alternate staggered system with mercury, as they will, of course, instantly relight when the power is restored. This combination often has another desirable feature in that the color of light from filament lamps combines well with the bluish-green-yellow of the mercury lamps to give an approximation of daylight.

The analysis in Table I shows that

the combined mercury and incandescent system has lower costs, both initially and on an over-all basis, than any of the fluorescent systems or the incandescent system alone. Only the straight mercury system is less expensive.

### Maintenance

Cleaning of reflectors and lamps is the heart of "Planned Lighting Maintenance." It can be shown that even for high labor rates, it is economical to clean fixtures more frequently than is usually done. The most economical frequency of cleaning can be established for any installation by consideration of three items:

- Annual cost per luminaire of owning and operating the lighting system
- Rate of depreciation due to dirt collection on units
- Cost of cleaning

(A) To indicate how to find the annual cost of owning and operating a lighting system, the following analysis has been made for an 8-foot two-reflector type industrial unit employing four 40-watt fluorescent lamps. A similar analysis could, of course, be made for any type of reflector and set of operating conditions.

Equipment (less lamps) and its installation cost per outlet .....	\$42.50	
Annual owning cost at 16-2/3 per cent per year.....		\$ 7.10
Lamp replacement cost (4000 hours annual operation) (Lamps replaced once a year)		
Lamp cost, 30% discount (4 x \$1.00 x 70%) .....	2.80	
Labor to replace.....	.80	3.60
Annual energy cost at 1¢/KWH (191 watts x 4000 hours) .....		7.60
Annual cost per outlet.....		\$18.30

This is the operating cost per outlet for 4000 hours, excluding cost of cleaning, regardless of quantity of light received.

(B) In order to determine the Rate of depreciation due to dirt collection for any particular type of luminaire, a simple test may be made in the area in which they are used. This consists of three steps as follows:

Step 1 — Clean all units and start with relatively new lamps so that

to Page 51 →

# WHAT MAKES McDANEL GRINDING BALLS so outstanding in performance?



## *Mill Testing and Rigid inspection Eliminate all but the Best*

Throughout their manufacture, McDanel Grinding Balls are carefully inspected to maintain the high standards of quality and service for which all McDanel products are known.

Before shipment each and every McDanel Grinding Ball is run in an uncharged mill and time-tested for its ability to withstand abrasion under severe conditions.

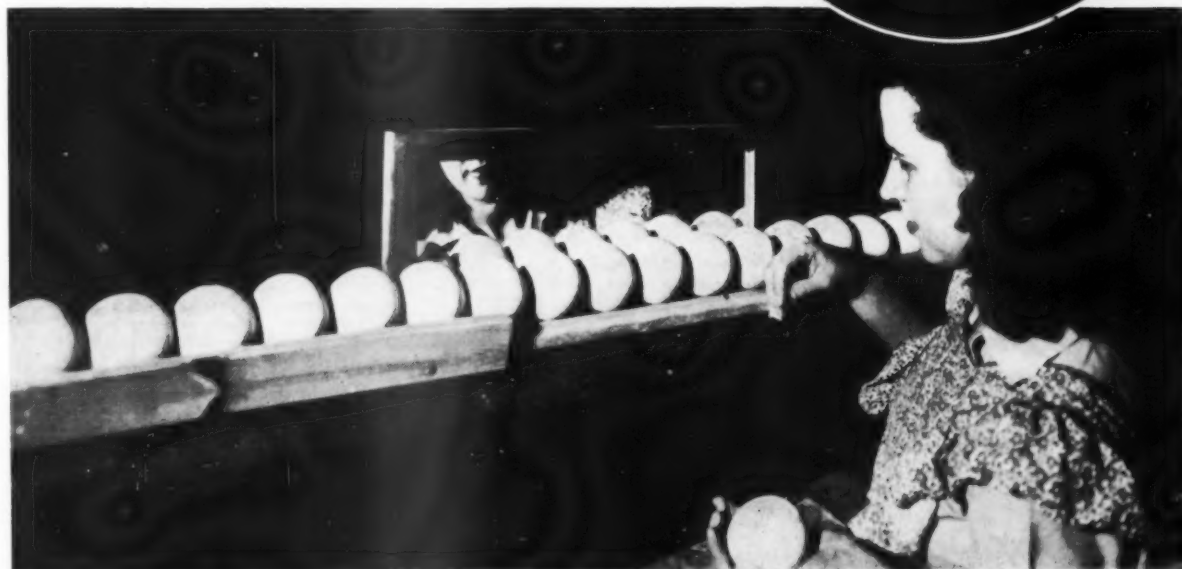
Their final inspection eliminates any ball that shows the least imperfection.

Thus McDanel Grinding Balls come to you pre-tested, individually inspected and ready to give outstanding performance in your grinding operations.

CHICAGO VITREOUS ENAMEL PRODUCT  
COMPANY

EXCLUSIVE REPRESENTATIVES  
FOR THE ENAMELING INDUSTRY

MILL HEAD ASSEMBLIES... DOOR LINING BLOCKS  
STANDARD MILL LINING BRICKS... SPECIAL MILL LINING SHAPES  
PORCELAIN GRINDING JARS and JAR MILLS  
METAL COVERED GRINDING JARS and JAR MILLS





## 2 WAYS TO APPROACH A COLOR PROBLEM

### • BURN THE MIDNIGHT OIL



### • OR ASK DRAKENFELD TO HELP

**I**T'S TOUGH to see "the light of day" on a porcelain enamel color problem if you have to burn the midnight oil. Even if you do, it takes so much of your time and effort, there aren't enough hours in the day to tackle other important tasks that require attention. So take a tip—let Drakenfeld help. We believe that our experience and technical skill can be of real value to you in getting the answer to your particular color problem.

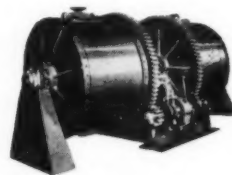
Whether you are faced with the job of formulating new colors, matching old ones, or applying colors in new ways, we take every precaution to assure you top quality, uniformity and satisfaction. The know-how of our technologists and our high standards of color manufacture can result in greater production, fewer rejects and better ware at greater profit.

Whatever your need—porcelain enamel colors for signs, for home, professional and institutional utensils and appliances, or for porcelain enamel used architecturally or industrially—Drakenfeld facilities and cooperation are yours for the asking. Learn all about our reliable service. Write us today.

**DEPENDABLE SERVICE ON:** Oxide Colors . . . Screening Paste . . . Graining Colors . . . Squeegee Oils and Mediums . . . Rotospray Sifters . . . Steveco Grinding Mills . . . Porcelain Grinding Balls . . . Porcelain Mill Linings.

#### 5 SAVINGS WITH STEVECO MILLS

Time  
Labor  
Horsepower  
Floor Space  
Initial Costs



Steveco high-efficiency duplex mills wet-grind porcelain enamel materials better, faster and at low cost. Many outstanding construction features proved in hard day-after-day service in many plants. Wide range of sizes and linings, with all types of drives. Write for catalog, then let us study your grinding needs and recommend the correct type for your requirements.



#### Rotospray — a millroom must!

The Rotospray helps you get properly prepared slip for the production line. Indispensable for "reconditioning" enamel slip. Equally valuable at ground coat dip tanks. Ideal for any job that requires speedy, positive sieving. Strains through a long-life vertical screen—no clogging. Standard and Junior sizes. Capacities range from 300 to 1,000 G.P.H., depending on nature and specific gravity of product, screen mesh and sifter size. Write for descriptive folder.

**Drakenfeld**



**YOUR PARTNER IN SOLVING COLOR PROBLEMS**

**B. F. DRAKENFELD & Co., Inc. 45-47 Park Place, New York 7, N.Y.**

Factory and Laboratories: Washington, Pa.

Pacific Coast Agents: Braun Corp., Los Angeles 21 . . . Braun-Knecht-Helmann Co., San Francisco 19



Industrial lighting . . . .

→ from Page 48

- replacement will not be necessary during test.
- Step 2 — After a specified time has elapsed, preferably 4 months, or at least 2 months, make foot-candle readings in the test area.
- Step 3 — Clean the reflectors and lamps again, and with the same lamps installed, make a second test of footcandle readings, using same locations.
- The difference between the before and after footcandle readings (Steps 2 and 3) will give the amount of light

In one industrial plant where a test was conducted, the light meter indicated an average of 34 footcandles in an area after four months of no maintenance (Step 2). The lamps and reflectors were then cleaned and the illumination was found to have an average of 40 footcandles (Step 3). This shows that 6 footcandles were lost due to the dirt that had collected during the four months. Six footcandles is 15% of the total of 40 available after washing, and by dividing 15% by 4 the "rate of depreciation through dirt collection," on the lighting equipment in this particular industrial plant, was found to be about 4% per month.

TABLE II  
MONTHS BETWEEN CLEANING OF LUMINAIRES FOR  
OPTIMUM ECONOMY

Annual Cost of Light- ing per Luminaire (Item A) (excluding cost of cleaning)	Cost of Cleaning per Luminaire (Item C)	Months Between Cleaning for a Range of Depreciation Rates (Item B)			
		4%	6%	8%	10%
\$12.50	10c	2.1 Mo.	1.7 Mo.	1.6 Mo.	1.3 Mo.
	20c	2.9 Mo.	2.3 Mo.	2.0 Mo.	1.8 Mo.
	50c	4.4 Mo.	3.6 Mo.	3.0 Mo.	2.6 Mo.
	\$1.00	5.5 Mo.	4.7 Mo.	4.0 Mo.	3.5 Mo.
\$20.00	10c	1.7 Mo.	1.4 Mo.	1.2 Mo.	1.0 Mo.
	20c	2.3 Mo.	1.9 Mo.	1.6 Mo.	1.4 Mo.
	50c	3.6 Mo.	3.0 Mo.	2.5 Mo.	2.2 Mo.
	\$1.00	4.7 Mo.	3.9 Mo.	3.3 Mo.	2.9 Mo.
\$30.00	10c	1.4 Mo.	1.1 Mo.	1.0 Mo.	.8 Mo.
	20c	1.9 Mo.	1.6 Mo.	1.3 Mo.	1.2 Mo.
	50c	3.0 Mo.	2.4 Mo.	2.0 Mo.	1.8 Mo.
	\$1.00	4.1 Mo.	3.3 Mo.	2.7 Mo.	2.5 Mo.
\$40.00	10c	1.2 Mo.	1.0 Mo.	.8 Mo.	.8 Mo.
	20c	1.7 Mo.	1.4 Mo.	1.2 Mo.	1.0 Mo.
	50c	2.6 Mo.	2.0 Mo.	1.8 Mo.	1.6 Mo.
	\$1.00	3.6 Mo.	2.8 Mo.	2.5 Mo.	2.2 Mo.

lost due to the dirt collected on the lighting units and the lamps. This loss can be expressed in per cent of total available light as measured in Step 3. Then, to obtain the rate of depreciation per month, divide the per cent of light lost by the number of months elapsed between the time the test was started (Step 1) and when it was completed.

- (C) The average cost of cleaning lighting units can readily be obtained from time studies of the labor required plus the cost of cleaning materials.
- After establishing acceptable values for items A, B, and C, the number of months (T) which may elapse between cleaning periods, in order to have a minimum unit cost of light

(X), may be found by solving the following formula\*\* for various assumed cleaning periods and then choosing the one giving a minimum cost.

$$X = \frac{A + (C \times \frac{12}{T})}{\frac{BT}{100 - \frac{BT}{2}}}$$

For example, if \$18.30 is taken for item A, 4% for item B and \$0.60 for item C, the unit cost (X) can be computed for each of the assumed periods of 3, 4, 5, etc. months. In this particular case the minimum cost will be found for approximately 4-month periods. Table II gives the cleaning period (T) for a range of values for items A, B, and C. In this table the computed cleaning period (T) which comes closest to the above example is 3.6 months, which is the period found for optimum economy for values of \$20.00 for A, 4% for B, and \$0.50 for C.

Conclusion

The cost of proper industrial lighting is usually a small portion of the total cost of a manufacturing plant, whether investment or operating expenses are considered. Nevertheless, it economically justifies a high factor of importance when evaluated on a basis of its contribution to effectiveness of plant operation. Lighting as an environmental factor, lighting as a production tool, and lighting as a safety factor can all be recognized as contributors to safe and easy seeing conditions — under which work processes can be accomplished in a most satisfactory manner.

The well lighted plant will only remain effective in proportion to the maintenance performed. Fifty foot-candles may depreciate to thirty foot-candles and pennies may be saved by reduced maintenance costs, but on the other hand dollars are lost in light paid for but not received.

\* "Lighting Maintenance in War Industry Plants," by A. K. Gaetjens, LIGHT Magazine, Issue No. 6, 1942.

\*\* The development of this formula is discussed by A. K. Gaetjens in LIGHT Magazine, Issue No. 5, 1942.

**THANKS**

For the grand response!

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# S Analytical Check-up Crew

W "booked" into November!

Ferro's newest contribution to increased efficiency and lower production costs, the *Analytical Check-up Service*, has already been scheduled solid for September, most of October and into November.

Introduced little more than a month ago, this new service is bringing the last of the *variables* in Porcelain enameling under control. For instance: within 48 hours, atmospheric contamination of the ware can be "spotted" and, invariably, means found for correction. Irregularities in firing, due to uneven temperatures, are now easily detected with Ferro's exclusive three-point temperature recording device. Moreover, this service includes a complete check-up on furnaces and driers as well as exacting analyses of atmospheric conditions in other parts of the plant.

If you have not already arranged for Ferro's new *Analytical Check-up Service*, we suggest you act promptly. Contact your Ferro Representative or write us direct for complete details and a Check-up Reservation.

**ENAMEL CORPORATION**

EAST 56TH STREET



CLEVELAND 5, OHIO

→ from Page 44

reference works, acquire additional foreign publications, increase the scope of its periodical subscriptions, and enlarge its collection of books in collateral fields such as chemistry, physics and mineralogy. This library has a \$10,000 fund for this work during the coming year.

Miss Van Schoick, who has had wide experience in editing ceramic abstracts and, in recent years, editing the Journal of the American Ceramic Society, is one of the few women who are fellows of the ACS. She is a graduate of Illinois Wesleyan University.

#### **Architectural porcelain enamel described in new PEI brochure**

The application and use of architectural porcelain enamel is described in a new 16-page sales brochure recently published by the Porcelain Enamel Institute.

Each type of architectural application is discussed in detail, including its uses in standardized new constructions such as chain stores, gasoline stations and restaurants.

A PEI advertisement in the August, 1947, issue of *Architectural Record* featured an offer of this booklet which is available gratis from the Porcelain Enamel Institute, 1010 Vermont Avenue, N. W., Washington 5, D. C. Write for booklet A.I.A., file No. 15-H-2.

#### **Carnegie-Illinois research appointment**

Dr. Maxwell Gensamer has been appointed assistant to director of research of Carnegie-Illinois Steel Corporation, it was announced by Dr. E. C. Bain, vice president in charge of research and technology for the company.

#### **Hotpoint purchases Milwaukee plant**

James J. Nance, president, Hotpoint, Inc., has confirmed the announcement that Hotpoint has purchased the war surplus Allis-Chalmers plant, Milwaukee, Wis., from the War Assets Administration. Facilities will

be installed to manufacture electric water heaters, automatic dishwashers, sink tops and cabinets, with first operations scheduled for December, 1947, said Nance.

#### **Professor Parmelee dies**

It is with deep regret that we announce the passing of Cullen Warner Parmelee, professor emeritus, Department of Ceramic Engineering, University of Illinois, on August 20. He died of a heart attack at his summer home in Pilgrim, Michigan.

Professor Parmelee was born in Brooklyn, New York, June 27, 1874. He received his early education at Manasquan, Asbury Park and Ocean Grove, New Jersey, and attended high school at Asbury Park. In 1896 he was graduated from Rutgers University with the degree of Bachelor of Science.

#### **Lloyd to International Harvester**

It is reported that A. Sheldon Lloyd has joined the International Harvester organization at Evansville, Indiana, as foreman of the enameling division. Lloyd was formerly with Servel, Inc., as a ceramic engineer.

#### **Lindemann & Hoverson personnel change**

David Root, formerly of Landers, Frary & Clark, New Britain, Conn., has joined the organization of A. J. Lindemann & Hoverson Company, Milwaukee, replacing Paul Gerdes, who is now associated with Hotpoint, Inc., Chicago, according to a recent report.

#### **Mercier advanced by Florence Stove**

Leo Mercier has been appointed general foreman in charge of the enameling department at Florence Stove Company's plant in Gardner, Mass., according to W. T. MacKay, vice president.

#### **New superintendent at Landers, Frary & Clark**

George Wiese has been appointed superintendent of the enamel plant at Landers, Frary & Clark, New

Britain, Conn., replacing David Root, according to S. H. Raymond, assistant personnel director.

#### **Paul Gerdes to Hotpoint**

It is reported that Paul Gerdes, formerly porcelain plant superintendent at A. J. Lindemann & Hoverson Co., Milwaukee, Wisconsin, is now associated with the Hotpoint, Inc., organization, Chicago.

#### **Florence Stove advances Vaughn**

Myron E. Vaughn has been appointed director of purchases for Florence Stove Company's plant at Gardner, Mass., it has been announced by W. T. MacKay, vice president.

Vaughn, personnel manager since 1941, has been associated with Florence Stove for 15 years. He assumed his new duties September 1.

#### **Ferro executive visiting Europe**

Brigadier Wilfrid Mavor, vice president and director in charge of foreign activities, Ferro Enamel Corporation, sailed from Montreal, Canada, August 16, for a year's stay in Europe.

#### **Cribben and Sexton names Port as production superintendent**

Dr. Frederick Port has been appointed production superintendent at Cribben and Sexton Company, Chicago, according to a company report. He succeeds Fred Doering, who had directed the manufacture of gas ranges for the firm since 1943.

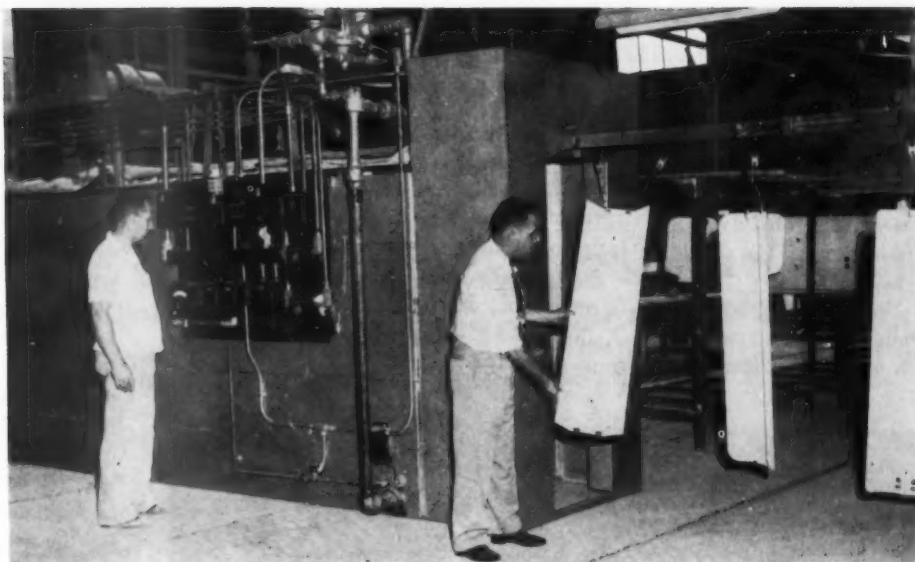
#### **New general superintendent at Geuder, Paeschke & Frey**

E. S. Fogle has been appointed general superintendent of Geuder, Paeschke & Frey Co., succeeding Ivan Shroll, according to C. E. Hoerig, vice president in charge of manufacturing for the Milwaukee, Wis., firm.

Before joining Geuder, Paeschke & Frey, Fogle was associated with the Ingersoll Steel Division, Borg-Warner Corp., Chicago. Shroll is no longer with the Geuder, Paeschke & Frey organization.



Photo shows latest in continuous drying equipment, a gas-fired infra-red dryer in the Industrial Enameling plant.



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NEW ORLEANS 6, LA.

## New industrial literature

### Study of national market areas

A new comprehensive study of the national market for shopping lines has been published by the research department of The Curtis Publishing Company.

Designed as a marketing tool, the study consists of a map outlining the 498 market areas in the United

States, and a companion booklet containing statistics which measure the value of each of the market areas as a part of the national market. The purpose of this study is to help solve some of the distribution problems of manufacturers of shopping line products.

Entitled "Market Areas for Shop-

ping Lines," the report defines shopping line products as those for which a purchaser shops around and compares price and quality before buying. These items account for about 80 per cent of the sales in the average department store.

The study is designed to help manufacturers and national distributors do the following: (1) Measure the purchasing power of an area as it applies to shopping line sales, (2) Determine the most profitable distribution of advertising expenditures, (3) Establish sales quotas, (4) Allocate sales territories, (5) Measure the effectiveness of retail outlets in an area in meeting the needs of that area, and (6) Compare the value of the territory surrounding a center with that of the center itself as a source of shopping line purchases.

### Laboratory instruments

A 2-page chart (R-1066) titled "Basic Characteristics of Useful Industrial Laboratory Instruments" has been announced by North American Philips Company, Inc., 100 East 42nd Street, New York, N. Y.

### Bulletin on finishing systems

Technical bulletin No. 501, "Planned Systems," outlining basic points to be considered in the planning of a complete organic finishing system, may be had through letterhead request from Peters-Dalton, Inc., 17900 Ryan Road, Detroit 12, Michigan.

### Rotary files

A 16-page illustrated booklet has been published to illustrate and list different types of rotary files. These include ball, oval, cylindrical (flat end and ball nose) tree, cone, inverted cone and other shapes, each in a wide range of diameters and lengths of cut.

A copy of "Grobet Rotary Files" will be sent on request to The Grobet File Co. of America, 421 Canal Street, New York, N. Y.

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## Identification for finishfotos

Here is the identification for the P.E.I. Forum pictures appearing on pages 30 and 31.

Top row, left to right: Frank Gibson (Baltimore Porcelain) and Charles Pearce (P.E.I.); Frank Hodek (Gen. Porcelain), Richard Turk (Pemco) and "Dusty" Miller, banquet speaker; N. J. Crowe (Crowe, Wallis) and G. W. Wortley (R. & A. Main); W. J. Plankenhorn and D. G. Bennett (U. of I.); Ed Hansen (Ferro) and Professor R. M. King (O.S.U.).

Second row: Ivan Oaks (Florence Stove), and C. P. Scribe and Clark Hutchinson (Ing-Rich); John Green (Brown Instrument); Ed Mackosek (P.E.I.) and Bob Weaver, Jr. (Bettinger Enamel); Wm. Fitzpatrick (Pressed Steel Car), R. D. Evans (Chicago Vit.) and Bud Friedmann (Better Enameling).

Third row: Robert Baker, Dan Cherry and Charles Rudin (Frigidaire); Glen Lynn (Ingersoll Steel), and Eddie Czolgos and Harry Sirovy (Century Vit.); S. E. Shepard and Wm. Jones (North American Mfg.); A. M. Langbein (American Stove), and H. W. Alexander and W. H. "Red" Pfeiffer (Frigidaire).

Bottom row: Tom Felton (Shepard Chem.) and Paul Schloffman (Tennessee Enamel); Institute members watching demonstration of adherence test equipment; James Readle, Louis George, John Shaver and James Vice (Porcelain Steel), and Ben Isaacs (Barrows Porcelain); O. J. Tattum (American Stove), Harry Sirovy (Century Vit.), M. B. Gibbs (American Stove), Glenn Lynn (Ingersoll Steel), Marcel Pouilly (American Stove), and, back to camera, Roy Beck and Wm. Fitzpatrick (Pressed Steel Car).



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## Porcelain enamel institute ninth annual forum

(Continued from Page 26)

ing of the Porcelain Enamel Institute.

### Job evaluation and production planning

F. H. Guthrie, Newark Stove Company, presided at the closing session of the Forum on Friday afternoon, September 12.

"Job Evaluation and Wage Incentives" was the subject of a paper by J. M. Schappert, National Metal Trades Association. The paper reflected a wide background of information on the subject covered.

"Production Planning" was the subject of the final paper by E. H. Smedley, of Stevenson, Jordan & Harrison, Inc. Actual work in the porcelain enameling industry by Mr. Smedley's company led to a close alignment of the subject with specific enameling problems.

### Annual forum banquet

The only planned diversion from the heavy program of papers and discussions was the Annual Banquet held on Thursday evening at the Deshler-Wallick Hotel. An excellent oppor-

tunity was presented for all of the "old timers" in the industry to get together, and for many newcomers to become better acquainted.

Seated as special guests at the speakers' table were N. J. Crowe, Crowe, Wallis & Co., Long Eaton, England, and G. W. Wortley, R. A. Main Ltd., Falkirk, Scotland. In brief informal responses to introductions, Mr. Wortley (Scotland) and Mr. Crowe (England) brought a message from the Institute of Vitreous Enamellers and commented on the present situation in England.

Mr. Crowe expressed the opinion that the people of his country have a strong feeling of gratitude for the part America has played in the English picture. He stated that the English are not satisfied with present conditions and that he believed they will change for the better — and possibly soon.

Entertainment consisted of stroller music and, as headline speaker, Thurman (Dusty) Miller with his homely philosophy and overflowing wit.

## Conventional pickle practice

(Continued from Page 32)

one is deposited in the first acid tank. He then deposits two unclean basket loads into the cleaner tanks and then another cleaned basket, or basket No. 2, is deposited into the second acid tank. After the first basket load has been immersed in the first acid tank for the proper time, which is controlled by a timer, it is transferred through the rinse tank to the nickel tank, and the third cleaned basket load is deposited into the acid tank. After the first basket load has been immersed in the nickel tank for 8 minutes, the immersion time again controlled by a timer, it is transferred through the rinse to the neutralizer tank. Basket No. 2 is then transferred from the acid through the rinse into the nickel tank, and one of the two basket loads (which we will call No. 4 and 5) is transferred from the cleaner through the cleaner rinse into

the acid tank, and an unclean basket load is deposited in the cleaner tank.

After No. 1 basket has been immersed in the neutralizer tank for 8 minutes, the time again controlled by a timer, it is transferred to the dryer. Number 2 basket is then transferred from the nickel tank through the nickel rinse into the neutralizer tank. Number 3 basket is then transferred from the acid through the acid rinse to the nickel tank. Number 4 basket is then transferred from the acid tank through the acid rinse to the nickel tank. Number 5 basket is transferred from the cleaner tank through the cleaner rinse into the acid tank, and another unclean basket load is immersed into the cleaner tank. From then on the cycle is continuous, and is controlled by the immersion time in the neutralizer tank, which is 8 minutes — No. 2

basket to the dryer, No. 3 basket to the neutralizer, No. 4 basket to the nickel, No. 5 to the acid and another unclean basket to the cleaner. With this cycle, we produce on an average of from 5 to 6 baskets per hour, depending upon the surface condition of the ware prior to processing.

### Cost breakdown

Following is cost breakdown, based on 100 square feet produced: square feet produced — 3,197,909; grand total for labor — \$13,644.23; grand total for material — \$1,623.31; labor cost per 100 square feet — \$0.427; material cost per 100 square feet — \$0.0508; total cost per 100 square feet — \$0.4778.

### Manual pickling room advantages

The advantages of a manually controlled pickling room over the automatic or continuous are many.

For an initial cost of \$14,387.73 for equipment, we observe a production potential of 2,687 square feet per hour.

Other than oiling and greasing the hoist and periodic replacement of the hoist and transverse cables, there is practically no maintenance cost.

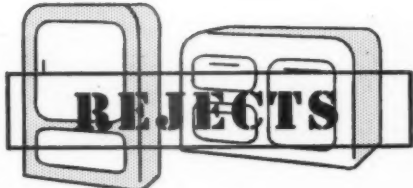
Most important is the full and complete control over each and every basket load being processed, and when we realize the type and condition of the various steels we have been forced to porcelain enamel to continue production, any further elaboration on the importance of that individual control would be superfluous. We might add, though, that, due to that individual control, no material was returned for re-pickle nor could we trace any rejects in ground or cover coat to poor surface preparation.

Constant visual observance of all tanks for condition of solutions, solution levels, temperature, broken or defective steam, water and air lines are other factors in favor of a manual pickling room.

### Editor's Note:

Additional author's resumés and excerpts from forum papers will appear in the November issue of *finish*.



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# PICKLE ROOM

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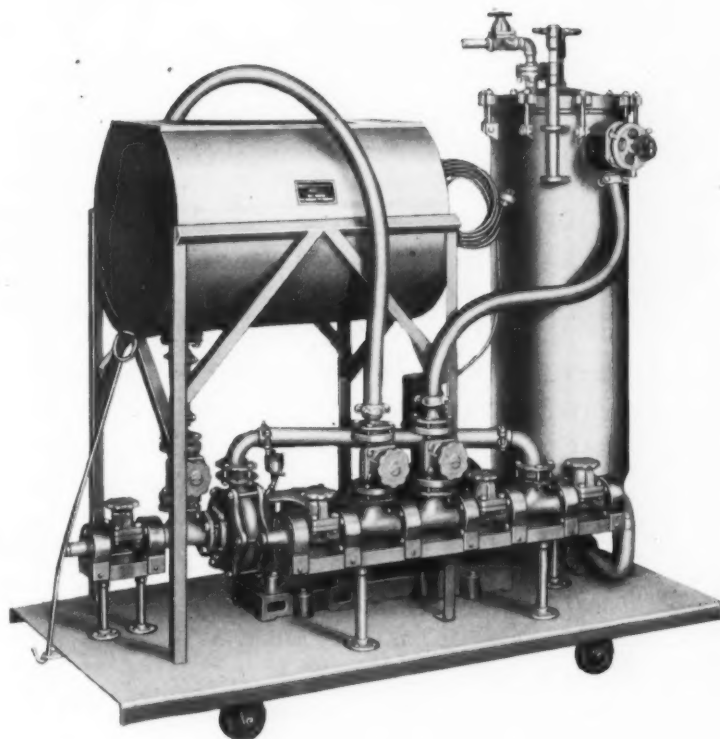
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1000 lb cap. Abbe mill (new lining); 800 lb cap. Patterson mill; 50 lb cap. Abbe mill; 5 Binks brushing tables and exhaust; 4 Binks spray booths with Dyna precipitator; 8 Model 19V Binks spray guns, excellent cond.; Ferro 5' x 12' box-type furnace and forks; Complete Alfrax muffle for Boland furnace; 3 Monel pickle baskets, 33" x 88" x 16"; Model 610 Photovolt Reflectometer (new); Type 66 Hevi Duty Electric Co. lab furnace; New Hoskins hanging rack, hangers, hooks; 35 boxes McDanel No. 235 lining brick; 2 boxes McDanel No. 235 fill-in brick; McDanel door frame brick for 36" mill; 7000 lb Trojan No. 62 Cleaner; 1400 lb 2 1/2" mill balls; 900 lb Uverite 20H. Subject to prior sale.

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